

**THE  
FERNS AND FERN-ALLIES  
OF  
WEST TROPICAL AFRICA**

BY THE LATE

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BRITISH MUSEUM (NAT. HIST.), LONDON

BEING

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## FOREWORD

**THE** first edition of the “ Flora of West Tropical Africa ” dealt exclusively with flowering plants, though it had been intended to include ferns. This deficiency, for which the original authors were not responsible, has now been corrected in the present volume.

Mr. Alston was able to undertake the preparation of this important volume and completed his work about a year before his untimely death in 1958. He was an authority on the ferns of the world and had made a particular study of the African representatives. For many years he identified ferns from this region and, largely due to his stimulus, extensive collections were built up at the British Museum (Natural History) and at Kew. He also had the great advantage of examining the material preserved in a number of European herbaria. It is unfortunate that he has not lived to see the publication of this work.

It is very gratifying to acknowledge the special efforts made by Dr. C. D. Adams, of the University College of Ghana, and Mr. H. J. Savory, formerly at the University College, Ibadan, Nigeria. They have helped greatly in securing adequate material and in furthering the preparation of the volume. The unstinted co-operation of the authorities at the British Museum has been invaluable and the magnificent collections there have been indispensable to the completion of the work.

Mr. R. W. J. Keay has been indefatigable in his editorial duties and has succeeded admirably in ensuring that the contents of the supplement conform as far as possible with the main part of the revised Flora. The manuscript has been printed as Mr. Alston left it, although it is known that he wanted to make some amendments and he was actually in possession of the manuscript at his death but it remained unaltered. The work has been seen through the press by Mr. F. N. Hepper. Valuable assistance has also been given by Mme. Tardieu-Blot, of the Muséum National d'Histoire Naturelle, Paris, and Mr. F. Ballard of the Kew Herbarium.

From her outstanding knowledge of the cytology of ferns Professor Irene Manton of the University of Leeds, has been good enough to contribute the cytological information appended to this volume.

There is little doubt that botanists and others interested in the flora of Africa will welcome this addition to the botanical literature of the continent and the volume will certainly become an invaluable reference source, even for those interested in the flora beyond the region with which it primarily deals.

G. TAYLOR.

ROYAL

BOTANIC

GARDENS,

KEW.

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# FLORA

OF

# WEST TROPICAL AFRICA

THE BRITISH WEST AFRICAN TERRITORIES,  
LIBERIA, THE FRENCH AND PORTUGUESE  
TERRITORIES SOUTH OF LATITUDE 18° N. TO  
LAKE CHAD, AND FERNANDO PO.

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# THE FERNS AND FERN-ALLIES OF WEST TROPICAL AFRICA

## INTRODUCTION

THE groups which may for convenience be called the Pteridophyta were not included in the first edition of this Flora nor in the "Flora of Tropical Africa." This has made some alterations in the method of treatment necessary and others possible.

As the vascular cryptogams were not included in the "Flora of Tropical Africa," it has not been possible to give references to that work. Instead references have been given to J. G. Baker's "Fern Allies" (1887), W. J. Hooker's "Synopsis Filicum" (1865-8) and to the additional species in Baker's second edition (1874). For the generic descriptions references have been given to Copeland's "Genera" (1947) and to Sim's "Ferns of S. Africa," ed. 2 (1915). The plates of the later work and extra species are also cited. The plates in Mme. Tardieu's recent work "Les Pteridophytes de l'Afrique intertropicale française" (1953) are particularly valuable and they have also been cited.

Instead of the method of citing specimens seen with a "!", an abbreviation has been used to indicate the herbarium in which the specimen is deposited, or else a reference to the author (e.g. "ex Tard.") for those records extracted from literature. The abbreviations for the herbaria are :

- B —Botanisches Museum, Berlin-Dahlem.
- BM —British Museum (Natural History).
- C —Universitets Botaniske Museum, Copenhagen.
- FHI —Forest Herbarium, Ibadan.
- GC —Ghana Herbarium, Achimota.
- GH —Gray Herbarium, Harvard University.
- IFAN —Institut Français d'Afrique Noire, Dakar.
- K —Royal Botanic Gardens, Kew.
- LISC —Centro de Botanica da Junta de Investigações Coloniais, Lisboa.
- LISJC —Jardim Colonial e Museum Agricola Colonial, Lisboa.
- NJ —Sierra Leone Herbarium, Njala.
- OXF —Fielding Herbarium, Oxford.
- P —Muséum National d'Histoire Naturelle, Paris.
- US —National Museum, Smithsonian Institution, Washington.

The writer wishes to acknowledge his debt to the following : Mr. F. Ballard for his preliminary work ; Prof. R. E. Holttum who generously loaned a proof copy of his "Ferns of Malaya" ; Miss Stella Ross-Craig for the illustrations made under Mr. F. Ballard's guidance and Miss E. M. Stones for the remaining illustrations ; and especially all the collectors who have so liberally supplied the material which made this work possible.

The descriptions of the gametophytes have been compiled from literature and it cannot be assumed that they will apply to all the West African species.

It is probable that the list of pteridophytes is now fairly complete, but there are certain remarkable absences, for example *Equisetum ramosissimum* Desf., *Humata repens* (Linn. f.) Diels, *Stenoloma chinense* (Linn.) Bedd., *Pteris cretica* Linn., *Anogramma leptophylla* (Linn.) Link, *Hymenophyllum tunbridgense* (Linn.) Sm., *Ampelopteris prolifera* (Retz.) Copel., *Thelypteris squamulosa* (Schlecht.) Ching and *Hypodematium crenatum* (Forsk.) Kuhn.

Some areas still seem to be rather imperfectly known, for example the Jos Plateau in Northern Nigeria, the Loma Mts. in Sierra Leone and the high ground of the British Cameroons. The ferns of the Nimba and Fouta Djallon Mountains and that of Fernando Po are not well represented in collections in Great Britain. There are also certain genera which have received insufficient study, especially *Marsilea*, *Isoetes* and *Lomariopsis* and it is probable that the range of the species will be extended. Fruiting material of *Salvinia* and *Azolla* has not been collected in the area.

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## GLOSSARY

*acrostichoid*, with the arrangement of the sporangia resembling that of *Acrostichum*, i.e. spread over the undersurface of the fronds.

*acumen*, the apical tapering point of an acuminate leaf.

*alete*, spores without visible tetrad scars (laesurae).

*anadromous*, a frond or pinna is said to be anadromous when the first leaflet (or vein) arises from the upper flank of the rachis or costa towards the apex. *Catadromous* is the reverse.

*annulus*, the hygroscopic thickened cells, whose elasticity causes the dehiscence of the sporangium (in ferns).

*antheridium*, the male organ of a prothallus which, before dehiscence, encloses the male gametes (antherozoids).

*antherozoid*, the male gametes, which are released by the dehiscence of the antheridium.

*archegonium*, the female organ of a prothallus, which is usually flask-shaped with a female gamete inside at the base.

*arista*, a stiff awn-like bristle terminating a leaf.

*basipetal*, of any organs which arise (or mature) in succession from the apex to the base. Acropetal is the reverse.

*basisopic*, looking towards the base, the reverse of acroscopic.

*biciliate*, with two cilia. castaneous, chestnut-coloured.

*caudex*, the thickened axis of a plant consisting of stem and root.

*clathrate*, especially of scales in which the cells have thickened opaque lateral walls and thin translucent surface walls, giving a latticed appearance with a translucent area (called the lumen) in the centre of the cell.

*coenosorus*, sorus originating from a group of sori which have coalesced.

*compital*, sori arising at the point of junction of three or more veins.

*costa*, a midrib or middle-nerve of a pinna or pinnule of a frond.

*costule*, a midrib or middle-nerve of a segment of a pinnule.

*decompound*, fronds several times divided or compounded.

*dictyostele* (adj. *dictyostelic*), when the leaves are borne close together so that the foliar gaps in the stele overlap producing an elaborate network; this is known as a dictyostele. A solenostele is similar but the foliar gaps do not overlap.

*dimidiate*, of pinnae when one side is so much smaller than the other that it appears to be absent and the costa runs down one side.

*elater* (in *Equisetum*), four hygroscopic bands which are attached to the spores and serve for dispersal.

*exindusiate*, without an indusium.

*fronds adherent to the caudex*, when the base of the frond is not articulate (or jointed) to the caudex and remains adhering when it decays, instead of breaking off to leave a scar. J. Smith's term was desmobryoid, as opposed to erembryoid.

*gametophyte*, the generation (in Pteridophytes and Bryophytes) which bears the sexual organs. As opposed to the sporophyte, which is the asexual generation.

*gemmae*, an adventitious bud arising from the fronds of ferns and giving rise to new plants vegetatively.

*heterosporous*, with spores of two kinds ; megaspores and microspores, the megaspores usually give rise to female prothalli and the microspores to male prothalli.

*homosporous*, spores all of one kind or apparently all the same. Usually they give rise to hermaphrodite prothalli but in *Equisetum* some are male and others female.

*hyaline*, translucent and more or less colourless.

*hydathode*, an organ, resembling a stoma with functionless guard-cells, which exudes water.

*idioblast*, isolated cells, or cells that are not in contiguous groups differing markedly in form, size or contents from other constituents of the tissue of which they form a part.

*idioblastic sclereids*, scattered sclereids which are not aggregated in contiguous groups.

*indusium*, an epidermal outgrowth covering the sori in ferns Also applied to a modified portion of the margin which covers the sori, but that is more properly termed " false indusium."

*lamina*, the blade or expanded green portion of a frond or leaf as opposed to the stipes, petiole, rachis or costa.

*ligule*, in *Selaginella*, a minute organ which arises internally from the adaxial base of the leaf. Possibly it assists the rapid absorption of rain-water. In the *Isoetaceae* a subulate organ which arises from the adaxial side of the sporophyll above the sporangium. Its function may be the secretion of mucilage.

*megaspore* (sometimes incorrectly as macrospore). The larger kind of spore in heterosporous species ; it gives rise to the female prothallus..

*megasporangium*, a sporangium which contains only megaspores.

*microspore*, the smaller kind of spore in heterosporous species ; it gives rise to a male prothallus.

*microsporangium*, a sporangium which contains only microspores.



*monolete*, a bilateral spore having one scar (laesura).

*multiciliate*, with many cilia.

*mycorrhiza* (adj. *mycorrhizal*), the fungal element in the symbiotic union of certain fungi with the roots of plants, or in saprophytic prothalli.

*paraphysis* (pl. *paraphyses*). A sterile organ which occurs mixed with the sporangia in the sori of certain ferns. Probably some are modified hairs but others have been believed to be modified and sterilized sporangia.

*perispore*, an external layer arising from the tapetum, which remains adhering to the outer surface (exospore) of the spore. Sometimes called episore.

*photosynthesis* (adj. *photosynthetic*), the synthesis of carbohydrates by the chlorophyll of the green parts of plants under the influence of sunlight. The adjective is applied to the tissues engaged in this process.

*prothallus*, the sexual generation in the Pteridophyta. It may be photosynthetic or saprophytic, and monoecious or dioecious.

*protostele* (adj. *protostelic*), a stele consisting solely of a solid central vascular strand.

*pulvinus*, cushion-like swelling at the base of a pinna or pinnule.

*rhizophore*, a leafless root-bearing branch in *Selaginella*. The branches divide into 3s (rarely 4) of which one (rarely 2) is a rhizophore and the other two lateral shoots.

*scale*, the rhizome of a fern is protected by flat, often membranous scales (rarely hairs in some primitive types). These cover the apex and growing parts and are sometimes found covering the whole or part of the fronds in mature plants.

*sclereid*, cells with thick walls which are generally pitted, but generally shorter than fibres, and usually lignified, the cells being isodiametric, elongated and rod-like, columnar, or branched in form. An idioblastic sclereid is one that is isolated in a different type of tissue.

*siphonostele* (adj. *siphonostelic*), a tubular stele.

*sobole*, a sprouting shoot or runner, which arises shortly above the base of a stem and spreads over the surface of the ground. They normally have reduced leaves and wide interspaces. By rooting (or bearing bulbils) at the apex they propagate the species asexually.

*soboliferous*, bearing soboles.

*solenostele* (adj. *solenostelic*), a cylindrical stele with widely separated leaf-gaps.

*sporangium*, a spore case or sac bearing and enclosing spores. Sporangia are usually more or less stalked and may have some thickened cells called the annulus.

*spore*, a cell which is set free from the sporangium of the asexual generation (sporophyte) and germinates to give rise to the sexual generation (gametophyte or prothallus).

*sporocarp*, the body which encloses the sori and sporangia (both megasporangia and microsporangia) in the *Marsileaceae*. It may be a modified pinnule.

*sporophyte*, the asexual spore-producing generation.

*sporophyll*, a leaf or modified leaf which bears sporangia.

*stele*, the whole vascular system of the caudex is a stele, which may be of several kinds (see protostele, siphonostele, solenostele and dictyostele). Also a leaf-trace, of which the individual strands may be called meristeles.

*strobilus*, the cone-like structure containing the reproductive organs as in *Selaginella* and *Lycopodium*. It consists of overlapping sporophylls bearing adaxial sporangia.

*synangium*, a solid compound structure formed by the union of several sporangia as in *Marattia* and *Psilotum*, as opposed to a multilocular sporangium.

*thalloid*, resembling a thallus, i.e. flattened and green but not leafy.

*trilete*, having a tetrad scar with 3 scars (laesurae) radiating from the pole. These spores are radially symmetrical.

*vernation*, the manner of unfolding of the leafbuds.

$\mu$ , Greek letter, an abbreviation for micron or micromillimetre, which is the thousandth part of a millimetre.

## CLASSIFICATION

The primary classification of vascular plants into Spermatophyta and Pteridophyta is now obsolete (Eames, p. 405) as it has been shown that the latter should be divided into four major groups, Lycopsidea, Psilopsida, Sphenopsida and Pteropsida. All these are known to have been separate groups in paleozoic times (Eames, p. 404). All are presumably derived from the green algae (Chlorophyta), but the transmigration to a terrestrial habitat may have taken place independently (Eames, p. 403). The biciliate antherozoids of the Lycopsidea suggest that they may have had a separate origin from the groups with multiciliate antherozoids. The production of seeds is a stage in evolution and has taken place independently in the different phyla (Eames, p. 402). The living representatives of the groups included in this book are, however, characterized by lacking flowers or seeds, and producing spores which develop into prothalli bearing the reproductive organs, antheridia (male) and archegonia (female). The ferns (Pteropsida <sup>1</sup>) are, however, more closely related to the seed plants (Spermatophyta) than to the Lycopsidea, Psilopsida and Sphenopsida, the so- called “ fern allies.”

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<sup>1</sup> The term “Pteropsids ” originated with E. J. Jeffrey in *Bot. Gaz.* 50 : 401-414 (1910).

## KEY TO THE MAJOR GROUPS

1.1. Leaves all narrow and simple (microphylls): **2**

1.2. Leaves with broad entire, often dissected, fronds (megaphylls), ----- (*PTEROPSIDA*)

2.1. Sporangia borne in the axils of the leaves: **3**

2.2. Sporangia borne on peltate scales, in terminal strobili; leaves united to form sheaths; stems jointed; spores smooth, with chlorophyll and hygroscopic elaters; prothalli hyaline, subterranean -(*SPHENOPSIDA*, *EQUISETALES*)

3.1. Sporangia not lobed, solitary, in the axils of the leaves; antherozoids biciliate

**LYCOPSIDA:** **4**

3.2. Sporangia 3-lobed; stems angular, green; leaves scale-like; spores all of one kind, bean-shaped, monolet; antherozoids multiciliate; prothalli brown, saprophytic -----(*PSILOPSIDA*, *PSILOTALES*) **4. Psilotaceae**

4.1. Spores all of one kind; leaves without ligules; plants terrestrial or epiphytic; sporangia in strobili or dispersed on the stem ----- (*LYCOPODIALES*) **1. Lycopodiaceae**

4.2. Spores of two kinds (megaspores and microspores); leaves with ligules: ----- **5**

5.1. Leaves grass-like; plants submerged, aquatic, with lobed corms; roots confined to the grooves between the lobes of the corm; sporangia chambered; megaspores trilete; microspores monolet (*ISOETALES*) **2. Isoetaceae**

5.2. Leaves somewhat moss-like; plants terrestrial with stems; roots springing from axillary rhizophores; sporangia not chambered; spores all trilete ----- (*SELAGINELLALES*) **3. Selaginellaceae**

KEY TO THE FAMILIES OF PTEROPSIDA

- 1.1. Sporangia without an annulus consisting of a row of thickened cells, or with a patch of thickened cells (*Osmunda*): **2**
- 1.2. Sporangia with a well-developed annulus consisting of a row of cells with thickened walls (FILICALES): **10**
- 2.1. Terrestrial (rarely epiphytic) ferns: **3**
- 2.2. Aquatic ferns:----- **7**
- 3.1. Annulus entirely wanting; stipules present or represented by sheathing brown scale-like membranes; sporangia massive with walls several cells thick; sessile or short stalked, often fused together; roots thick and fleshy: **4**
- 3.2. Annulus consisting of a patch of cells with thickened walls; stipules wanting or base of stipe expanded into a stipule-like flange (*Osmunda*); leaf-trace with a single C-shaped strand (FILICALES): ----- **5**
- 4.1. Leaves divided into a fertile and a sterile segment; leaf-trace C-shaped; spores trilete; no root hairs; vernation straight; small plants, up to 30 cm. high; prothallus hyaline, subterranean (OPHIOGLOSSALES) **5. *Ophioglossaceae*,**
- 4.2. Leaflets uniform with synangia borne on veins near the margin of vegetative leaflets; stipe with many vascular stands; spores minute, monolete (in W. African species); root hairs multicellular; huge plants with short thick trunks and leaves about 2 m. long; prothallus green (MARATTIALES) ----- **6. *Marattiaceae*,**
- 5.1. Sporangia all maturing simultaneously; annulus lateral: **6**
- 5.2. Sporangia developed in basipetal succession; annulus apical, cup-like; spores tetrahedral (in W. African species), trilete; fronds climbing by twining petioles or erect with 2 fertile segments arising from the base of the lamina; no stipule-like flaps; rhizome covered with hairs ----- **9. *Schizaeaceae*,**
- 6.1. Rhizome suberect without scales; stipules with stipule-like flaps at base, covered with woolly hairs when young; sporangia (in W. African species) covering surface of specialized pinnae at apex of frond; spores green, spherical, trilete. **7. *Osmundaceae*,**
- 6.2. Rhizome wide-creeping; stipules without flaps at base, some stellate hairs present when young; sporangia in punctate sori on vegetative pinnae; spores trilete (in W. African species), tetrahedral ----- **8. *Gleicheniaceae*,**
- 7.1. Sporangia enclosed in sporocarps; plants heterosporous: **8**
- 7.2. Sporangia borne in sori along veins; plants homosporous; rhizome short, suberect; fronds decompose, glabrous; spores tetrahedral; (*Ceratopteris*) ----- **17. *Adiantaceae*,**
- 8.1. Plants growing in shallow water or wet places, leaves sometimes floating; rhizome prostrate, rooting at intervals; leaflets 4 in a terminal cluster (in W. African species); sporocarps borne at or near the base of the stipe **10. *Marsileaceae*,**
- 8.2. Plants floating:----- **9**
- 9.1. Leaves in whorls of 3, two floating and the third submerged, finely dissected and root-like, the latter bearing the sporocarps; without true roots **11. *Salviniaceae*,**
- 9.2. Leaves in 2 rows, each leaf divided into 2 lobes, one floating and aerial and the other submerged; sporocarps borne on submerged lobes of leaves; roots at nodes ----- **12. *Azollaceae*,**
- 10.1. Annulus oblique: **11**
- 10.2. Annulus vertical: ----- **12**
- 11.1. Tree ferns with stout, erect, dictyostelic trunks (in W. African species), clothed with matted adventitious roots; scaly at apex; fronds large, up to 5 m., bipinnate or tripinnate; sporangia attached to a small raised receptacle on the surface of the veins

13. *Cyatheaceae*,

11.2. Filmy ferns with erect or creeping rhizomes; young parts covered with hairs; small fronds less than 30 cm.;

sporangia borne on columnar receptacles, marginal on vein endings ----- 14. *Hymenophyllaceae*,

12.1. Rhizome with hairs on young parts, creeping; stipes with many vascular strands; spores without perispore, trilete or monolete; fronds adherent to the caudex 15.

*Dennstaedtiaceae*,

12.2. Rhizome with scales on young parts: -----

13.1. Spores trilete, tetrahedral or globose, without perispore (? except *Notholaena*); fronds adherent to the caudex: 14

13.2. Spores monolete, rarely alele, bilateral: ----- 18

14.1. Stipes with many vascular strands; fronds pinnate, upper part fertile and covered with sporangia; paraphyses present, veins closely reticulate; mangrove swamps; (*Acrostichum*); see also below 17. *Adiantaceae*,

14.2. Stipes with one or two vascular strands: ----- 15

15.1. Sporangia with short or medium stalks, up to 4 cell long; scales not peltate; spores triangular in surface view: 16

15.2. Sporangia long-stalked with 5–7 cells, one or two cells thick; small epiphytes without indusia and paraphyses; scales not clathrate and not often peltate, pale brown; spores subglobose ----- 19. *Grammitidaceae*,

16.1. Indusium wanting or represented by a reflexed more or less modified marginal flap which opens inwards: 17

16.2. Indusium present, opening outwards ----- 18. *Lindsayaceae*,

17.1. Scales clathrate; idioblastic sclereids in epidermis; fronds elongate, elliptic to suborbicular, not pinnate; venation reticulate with no included veinlets; epiphytes with a mass of densely hairy roots; prothalli elongate; see also below 16. *Vittariaceae*,

17.2. Scales not clathrate; idioblastic sclereids not present; fronds pinnate or decompose, or, if simple, palmate; see also above ----- 17. *Adiantaceae*,

18.1. Spores without perispores; scales often peltate: 19

18.2. Spores with perispores; scales not peltate: ----- 23

19.1. Fronds articulate or articulate above the base of the stipe with caudex, breaking off leaving a scar or pinnae articulate with the rhachis (*Nephrolepis*); –sporangia long-stalked, stalk 7–10-celled: 20

19.2. Fronds adherent to the caudex and bases usually persistent; pinnae not articulate with rhachis: ----- 21

20.1. Veins copiously reticulate; articulation at base of stipe; indusia wanting; scales sometimes mixed with sporangia 20. *Polypodiaceae*,

20.2. Veins all free; articulation (except *Davallia*) above base of stipe; indusia present, opening outwards; scales never mixed with sporangia ----- 21. *Davalliaceae*,

21.1. Fronds simple, entire; epiphytes; sori elongate; paraphyses present or not: 22

21.2. Fronds pinnate; sori covering the whole surface of the fertile pinnae; many vascular strands in stipe; climbing fern with peltate scales; fronds dimorphous with broad sterile or narrow fertile pinnae; veins forming a single series of long narrow areoles close to the costa, otherwise free, forked or parallel; (*Stenochlaena*); see also above -- 20.

*Polypodiaceae*,

22.1. Stipes with two vascular strands; sori marginal; (*Vittaria*); see also above 16. *Vittariaceae*,

22.2. Stipes with several vascular strands; sori oblique; (*Loxogramme*); see also below ----- 20. *Polypodiaceae*,

- 23.1. Stipes with two vascular strands: 24
- 23.2. Stipes with more than two vascular strands: -----26
- 24.1. Stipes with two vascular strands united above into a 4-armed strand; rhizome scales clathrate; sporangia with rather long stalks 22. *Aspleniaceae*,
- 24.2. Stipes with two vascular strands united above into a single U-shaped strand; rhizome scales not clathrate: 25
- 25.1. Costae raised on upper surface at base, often also grooved; rhizome scales bearing unicellular hairs on margin and often on surfaces; sori round or rarely elongate, with or without indusia; no septate hairs 23. *Thelypteridaceae*,
- 25.2. Costae grooved above, with edges of groove often thin and raised, interrupted and enlarged at the junction of the midrib of a pinnule with the rachis; rhizome scales entire or toothed with 2-celled teeth; sori usually elongate, rarely almost round; indusium usually J-shaped; septate hairs sometimes present on upper surface of costae 24. *Athyriaceae*,
- 26.1. Sporangia covering the surface of the frond; rhizomes creeping or erect; stipes or pinnae sometimes articulate 25. *Lomariopsidaceae*,
- 26.2. Sporangia restricted to the sori: -----27
- 27.1. Sori round or slightly elongate, usually with reniform or peltate indusia 26. *Aspidiaceae*,
- 27.2. Sori elongate, with an elongate indusium opening inwards -----27. *Blechnaceae*,

LYCOPSIDA

LYCOPODIALES

## 1. LYCOPODIACEAE

Perennial herbs, terrestrial or epiphytic. Stems erect, prostrate or pendulous; branches leafy, dichotomous or pinnate. Leaves small, simple, 1-nerved, without ligules, usually spirally arranged, often decurrent, rarely with leaves on two planes. Sporophylls uniform, aggregated in terminal strobili, or in a few species fertile and sterile zones alternate. Sporangia solitary in the axils of the sporophylls, uniform, unilocular, reniform or globose, dehiscent into 2 valves.

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*LYCOPODIUM* Linn. — Bak. F. Allies 7 (1887); Sim F.S.A. 323 (1915); Nessel Bärlappgewächse 20 (1939), incl. *Urostachys* (Pritz.) Hert.

- 1.1. Sporophylls not differing from the foliage leaves and not arranged in strobili: 2
- 1.2. Sporophylls arranged in strobili: ----- 3
- 2.1. Epiphytic; leaves laxly spreading, elongate-elliptic, 3 mm. across *1. jaegeri*
- 2.2. Terrestrial; leaves closely appressed, subulate, 2 mm. across ----- *2. saururus*
- 3.1. Sporophylls not very different from foliage leaves; epiphytic species: 4
- 3.2. Sporophylls quite different from foliage leaves: ----- 6
- 4.1. Leaves with midrib indistinct, 1–2.5 mm. broad: 5
- 4.2. Leaves with distinct midrib, less than 0.5 mm. broad, about 5 mm. long ----- *5. verticillatum*
- 5.1. Leaves about 15 mm. long, acute, falcate, involute *3. mildbraedii*
- 5.2. Leaves about 7 mm. long, obtuse, not falcate, flat ----- *4. brachystachys*
- 6.1. Strobili not pedunculate: 7
- 6.2. Strobili pedunculate; plants terrestrial: ----- 11
- 7.1. Strobili terminal; epiphytic species, often pendulous, dichotomously branched from an erect base: 8
- 7.2. Strobili borne on lateral branches; terrestrial species with erect stems rising from a creeping base; sporophylls lacerate ----- *10. cernuum*
- 8.1. Sporophylls longer than sporangia: 9
- 8.2. Sporophylls and sporangia subequal in length: ----- 10
- 9.1. Leaves oblong-linear tapering at both ends, flat, membranous, not shiny, diverging at 45 degrees; strobili elongate, branched, with sporophylls gradually passing into foliage leaves *6. ophioglossoides*
- 9.2. Leaves lanceolate, broadest near the base, slightly revolute, shiny, spreading at right angles; strobili sharply divided from foliage leaves; sporophylls acute or obtuse ----- *7. staudtii*
- 10.1. Strobili about 10 cm. long, simple or once divided, 2.5 mm. in diam.; sporophylls shortly acuminate, usually shorter than sporangia; leaves lanceolate, about 1.7 cm. long, rounded at base, subsessile, fleshy *8. warneckeii*
- 10.2. Strobili about 6 cm. long, 1.25 mm. diam., 1–2 times dichotomous; sporophylls acute, just exceeding the sporangia; leaves ovate-lanceolate, about 1 cm. long, truncate at base, subsessile, subcoriaceous ----- *9. phlegmaria*
- 11.1. Leaves all similar, spirally arranged, hair-pointed; strobili 2–6-nate; stems never



tuberiferous *11. clavatum*

**11.2.** Leaves dimorphous; lateral leaves alternate, spreading, lanceolate; median leaves ascending, narrowly aciculate, not hair-pointed; strobili solitary; stems often terminating in tubers ----- *12. affine*

1. *Lycopodium jaegeri* (Hert.) Alston in Bull. I.F.A.N. 19 : 21 (1957).

Roux 2009: Synonym of *Huperzia jaegeri* (Herter) Pic.Serm.

*Urostachys jaegeri* Hert. in Rev. Sudam. Bot. 8 : 24 (1949); Tard. & Jaeg. in Bull. Soc. Bot. Fr. 94 : 301 (1947), name only.

On wet shaded rocks and trees; at about 3,500 ft. alt.

**Fr.G.:** Dalaba, Fouta Djallon Abbayes 744 (BM). **S.L.:** Fuen Koli, Mt. Loma Jaeger 1522 (ex Hert.).  
**Also in French Cameroons (Schnell 5614).**

2. *Lycopodium saururus* Lam. Encycl. Méth. Bot. 3 : 653 (1789); Bak. F. Allies 10 (1887); Sim F.S.A., ed. 2, 324: t. 175 (1915).

Roux 2009: Synonym of *Huperzia saururus* (Lam.) Trevis.

*Urostachys saururus* (Lam.) Hert. in Fedde Rep. 19 : 162 (1923); Nessel Bärlappgew. 78, fig. 13 (1939).

On ground in grassland; 10,000 ft. alt. and upwards.

**Br.Cam.:** Cam. Mt. Mann 2039 (BM), Luma 45/37 (BM), Adams 1295 (BM), Keay PHI 28611 (BM).  
**Also on Mts. Kenya, Elgon, Ruwenzori, Virunga, Kilimanjaro, Milanji, Drakensberg, St. Helena, Réunion and along the Andes.**

3. *Lycopodium mildbraedii* Hert. in Hedwigia 49 : 90 (1909).

Roux 2009: Synonym of *Huperzia dacrydioides* (Baker) Pic.Serm.

*Urostachys mildbraedii* (Hert.) Nessel l.c. 188 (1939).

*Lycopodium dacrydioides* Bak. in Bol. Soc. Brot. 4 : 158 (1886), name only; Bak. F. Allies 17 (1887), partly.

Epiphyte, up to 7,000 ft. alt.

**Fr.G.:** Nimba Mts. Schnell 263 (BM), Abbayes 461 (BM). **S.L.:** Loma Mts. Jaeger 373 (NJ); Heremafondu Plateau, Sankan Biriwa Deighton 3510 (NJ). **Br.Cam.:** Cam. Mt. Johnston (BM), Dunlap 221 (K), Mann 1408 (K); Mann's Spring Adams 1327 (BM), Brenan & Richards 4214 (BM), Mildbr. 3449 (B).

4. *Lycopodium brachystachys* (Bak.) Alston in Bol. Soc. Brot., sér. 2A, 30 : 19 (1956); not *L. brachystachyum* Hook. & Grev.

Roux 2009: Synonym of *Huperzia brachystachya* (Baker) Pic. Serm.

*Lycopodium dacrydioides* **Bak. var. brachystachys** Bak. F. Allies 18 (1887).

*Urostachys brachystachys* (Bak.) Hert. ex Nessel l.c. 189 (1939).

Epiphyte, up to 7,000 ft. alt.

**Fr.G.:** Nimba Mts. Schnell 2996 (B.M.). **S.Nig.:** Oban Talbot (BM). **Br.Cam.:** Cam. Mt. Mann 2041 (K); Buea Brenan 4386 (BM), Maitland 505 (K), Preuss 950 (BM, K); Victoria Greven 129 (K). **F.Po:** Mann 384 (K); St. Isabel Peak Guinea 2685 (BM).

5. *Lycopodium verticillatum* Linn. f. Suppl. Pl. 448 (1781); Bak. F. Allies 14 (1887); Engl. Pflanzenw. Afr. 2 : 73, fig. 70 (1908); Sim F.S.A., ed. 2, 325, t. 178 (1915).

Roux 2009: Synonym of *Huperzia verticillata* (L.f.) Trevis.

*Urostachys verticillatus* (Linn. f.) Hert. ex Nessel l.c. 121 (1939).

Epiphyte, at about 5,000 ft. alt.

**Br.Cam.:** Cam. Mt. (ex Engl.). **F. Po:** St. Isabel Peak Adams 1165 (BM).

Also in S. Tomé, Nyasaland, S. Rhodesia, Natal, Comoro Island and Réunion.

6. *Lycopodium ophioglossoides* Lam. Encycl. Méth. Bot. 3 : 646 (1789); Bak. F. Allies 21 (1887).

Roux 2009: Synonym of *Huperzia ophioglossoides* (Lam.) Rothm.

*Urostachys ophioglossoides* (Lam.) Hert. ex Nessel l.c. 238 (1939).

Pendulous epiphyte on trees in forest, at 2,500–8,700 ft. alt.

**Br.Cam.:** near Bamenda Migeod 369 (BM, K); road from Tombel Thorold TN 10 (K); Meyer Crater Maitland 973a (K); Cam. Mt. Johnson 117 (K), Mann 1409 (K); near Mann's Spring Boughey 12581 (BM), Brenan 4304 (BM). **F.Po:** Mann s.n. (BM, K), 384 partly (K); near Moka L. Adams 1108 (BM).

Also in other parts of tropical Africa and in the Mascarene Islands.

7. *Lycopodium staudtii* (Nessel) Adams & Alston in Bull. Brit. Mus. 1 : 183 (1955).

Roux 2009: Synonym of *Huperzia staudtii* (Nessel) Pic.Serm.

*Urostachys staudtii* Nessel in Fedde Rep. 36 : 189, t. 175 (1934).

*U. adolfi-friedericii* Hert. ex Nessel Bärlappgew 226 (1939); Rev. Sudam. Bot. 6 : 167, t. 13, fig. 66 (1940); not of Hert. ex Mildbr. (1922).

Epiphyte.

**IV.C.:** Taï Abbayes 2069 (BM). **Ghana:** E. Akim Johnson 674 (K); Aiyola F.R., Andoh FH 5147 (K); near Akoase Fishlock 83 (K). **S.Nig.:** Oban Talbot (K); Irerevien R. Unwin 130 (K). **Br.Cam.:** Johann-Albrechtshöhe Staudt 476 (ex Nessel).

Also in French Cameroons (Greven 298).

8. *Lycopodium warneckeii* (Hert.) Alston in Bol. Soc. Brot., sér. 2A, 30 : 20 (1956).

Roux 2009: Synonym of *Huperzia warneckei* (Herter ex Nessel) Pic.Serm.

*Urostachys warneckei* Hert. ex Nessel Bärlappgew. 213 (1939); Rev. Sudam. Bot. 6 : 166, t. 13, fig. 64 (1940).

At 2,000 to 2,500 ft. alt.; on oil palms.

**Fr.G.:** Macenta Baldwin 9803 (K). **S.L.:** Gegbwema Deighton 5658 (BM, NJ). **Lib.:** Bilimu Harley F. 71 (K); Bobei Mt., Sanokwele Baldwin 12174 (K); near Sanokwele Baldwin 13138 (BM); Du R., Firestone Plantation Linder 178 (K). **Iv.C.:** Massif de Dans Schnell 1316 (BM, P). **Br.Cam.:** Bamum, Bamenda Greven (ex Nessel). (Fig. 3.)

9. *Lycopodium phlegmaria* Linn. — Bak. F. Allies 22 (1887); Engl. Pflanzenw. Afr. 2 : 74, fig. 72 (1908).

Roux 2009: Synonym of *Huperzia phlegmaria* (L.) Rothm.

*Urostachys phlegmaria* (Linn.) Hert. in Bot. Archiv. 3 : 17 (1923); Nessel Bärlappgew. 215 (1939).

**Br.Cam.:** Cam. Mt. Mann 2042, partly (BM).

Widespread in tropical Africa and Asia.

10. *Lycopodium cernuum* Linn. — Bak. F. Allies 23 (1887); Sim F.S.A., ed. 2, 327, t. 179 (1915); Nessel Bärlappgew. 350, fig. 79 (1939).

Roux 2009: Synonym of *Lycopodiella cernua* (L.) Pic.Serm.

*Lycopodium heeschii* K. Müll. in Bot. Zeit. 19 : 164 (1861).

*Lycopodium cernuum* var. *heeschii* (K. Müll.) Nessel l.c. 358 (1939).

**Gam.:** Hayes 525 (K). **Fr.Sud.:** Fontieba Chev. 744 (K). **Port. G.:** Pussubé Esp. Santo 1120 (K, LISJC), 1698 (LISC). **Fr.G.:** Labé Schnell 37 (P); Guéckedore Schnell 2544 (P); Niou Schnell 1152 (P); Bossou Schnell 737 (BM, P), Boula Schnell 121 (P). **S.L.:** Freetown Dalz. 983 (BM, K); Sherbro Sc. Elliot 5838 (BM); Kumrabai Thomas 6732 (K). **Lib.:** Du R. Linder 244 (K); Sinoe Basin Whyte (K). **Iv.C.:** Yapo Abbayes 242 (BM). **Ghana:** Axim Road, Abra Box 2872 (BM); Oda Box 2063 (BM); Tarkwa Vigne FH 4126 (K); Kumasi Irvine 91 (K). **N.Nig.:** Nupe Yates (BM); Jos Plateau Lely P. 679 (K); Vom Dent Young 274 (K); Bida Meikle 1016 (K). **S.Nig.:** Lagos Hagerup 840 (K); Okomu F.R., Benin E.W. Jones 3950 (BM); Agulu Keay FHI 21522 (K); Milliken Hill, Enugu A.P.D. Jones FHI 1071 (BM); Ikwette Plateau, Obudu Keay & Savory FHI 25172 (BM). **Br.Cam.:** Buea Fraser 37 (BM); Bamenda Migeod 363 (BM, K). **F.Po:** Moka Exell 826!

Almost pantropical.

11. *Lycopodium clavatum* Linn. — Bak. F. Allies 25 (1887); Sim F.S.A., ed. 2, 328, t. 180 (1915); Mildbr. Wiss. Ergebn. 1910–11, 2 : 177 (1922).

Roux 2009: Accepted name

**F. Po:** forest margin, in Philippia scrub, Mildbr. 7156 (ex Mildbr.).

Also in S. Tomé, the mountains of E. Africa and almost cosmopolitan.

12. *Lycopodium affine* Bory Voy. Iles Afr. 2 : 204, 262 (1804).

Roux 2009: Synonym of *Lycopodiella affinis* (Bory) Pic.Serm.

*Lycopodium carolinianum* of various authors, partly, including: Ballard in Amer. Fern Journ. 40 : 74 (1950).

In open peaty boggy ground, among grass, up to 5,200 ft.

**Fr.G.:** Ditinn, Fouta Djallon Abbayes 1855 (BM); Forécanah Schnell 5480. (BM). **Fr.Sud.:** Taramora to Kangola Chev. 846 bis (K); Folo Chev. 8431 (K). **S.L.:** Newton Deighton 3011 (BM, K, NJ); Konima Glanville 125 (K, NJ); Bintumane Peak T.S. Jones 82 (K, NJ); Bassa T. Vogel (K); Rhombe Swamp Adames 8, 11 (NJ); Loma Mts. Jaeger 517 (NJ). **Lib.:** Monrovia Baldwin 5845 (BM, K); Duport Linder 1454 (K). **Iv.C.:** Monsson Abbayes 385 (BM). **S.Nig.:** Ikwette Plateau Savory & Keay FHI 25249 (BM); Old Calabar Robb (BM).

Widespread in tropical Africa and the Mascarene Island.

## ISOETALES

## 2. ISOETACEAE

Herbaceous perennial aquatics or plants of wet places. Usually with annual grass-like leaves arising in a tuft from a flattened corm-like axis; corm 3–4-lobed with black roots arising from the furrows between the lobes. Leaves terete, or flattened above, with a ligule near the base and a sporangium sunk in a cavity in the leaf below the ligule. Sporangia septate, usually containing either mega spores or microspores only.

*ISOETES* Linn. — Bak. F. Allies 123 (1887); Sim F.S.A. 339 (1915); Pfeiff. in Ann. Miss. Bot. Gard. 9: 79–232 (1922).

The species resemble submerged grasses superficially but can usually be recognized by the brick-like partitions, formed by the cells of the leaves, and the dark-coloured roots which arise from the furrows between the lobes of the corm.

- 1 Megaspores with numerous tubercles on each apical face, abaxial face closely tuberculate, drying greyish white; velum narrow; ligule broadly triangular; sporangium 1 cm. long, obovate-oblong, black and shining when dry; submerged aquatic; stomata present *1. melanotheca*  
Megaspores with a single central tubercle on each apical face, or apical faces smooth; ligule deltoid: ----- 2
- 2 Velum covering 2/3 of sporangium; stomata wanting *2. biafrana*  
Velum narrow, covering less than 1/3 of sporangium; stomata numerous:----- 3
- 3 Sporangium 7 mm. long, ovate-elliptic *3. pitotii*  
Sporangium 3–5 mm. long, broadly ovate ----- *4. nigritiana*

1. *Isoetes melanotheca* Alston in Sol. Soc. Brot., sér. 2A, 30: 15 (1956).

Roux, 2009: Accepted name

**Fr.G.:** Sériba to Sambailo Pitot (BM, P); Labé to Sériba Pitot (BM); Baidala to Sériba Pitot; Thianquel to Sériba Pitot (BM); Téliimélé Pitot (BM); Kinkon Falls, Pita Pitot (BM).

2. *Isoetes biafrana* Alston l.c. 15 (1956).

Roux 2009: Accepted name

**Br.Cam.:** L. Oku Keay FHI 28483 (BM, K), Savory (BM). **F.Po.:** L. Moka Guinea 2235 (BM), Adams 1115 (BM). (Fig. 2.)

3. *Isoetes pitotii* Alston l.c. (1956).

Roux 2009: Accepted name

**Fr.G.:** Sériba to Sambailo Pitot (BM, P). **Fr.Sud.:** Marigot de Balassoko, Bamako Duong Huu Thoi (BM).

4. *Isoetes nigrilitiana* A. Br. ex Kuhn, Fil. Afr. 196 (1868); Motel. & Vendr. in Actes Soc. Linn. Bord. 36: 388 (1883); Bak. F. Allies 131 (1887); Pfeiff. in Ann. Miss. Bot. Gard. 9: 114 (1922).

Roux 2009: Accepted name

*Isoetes garnieri* A. Chev. & P. Monnier in Bull. Mus. Hist. Nat., sér. 2, 18: 91, fig. 1 (1946).

**Fr.Sud.:** small temporary pools on rocks, Koulouba, near Bamako, 1,000 ft. Garnier (K). **N.Nig.:** margin of Benue R., Barter 1020 (K).

**Also in Ubangi (Le Testu 3016).**

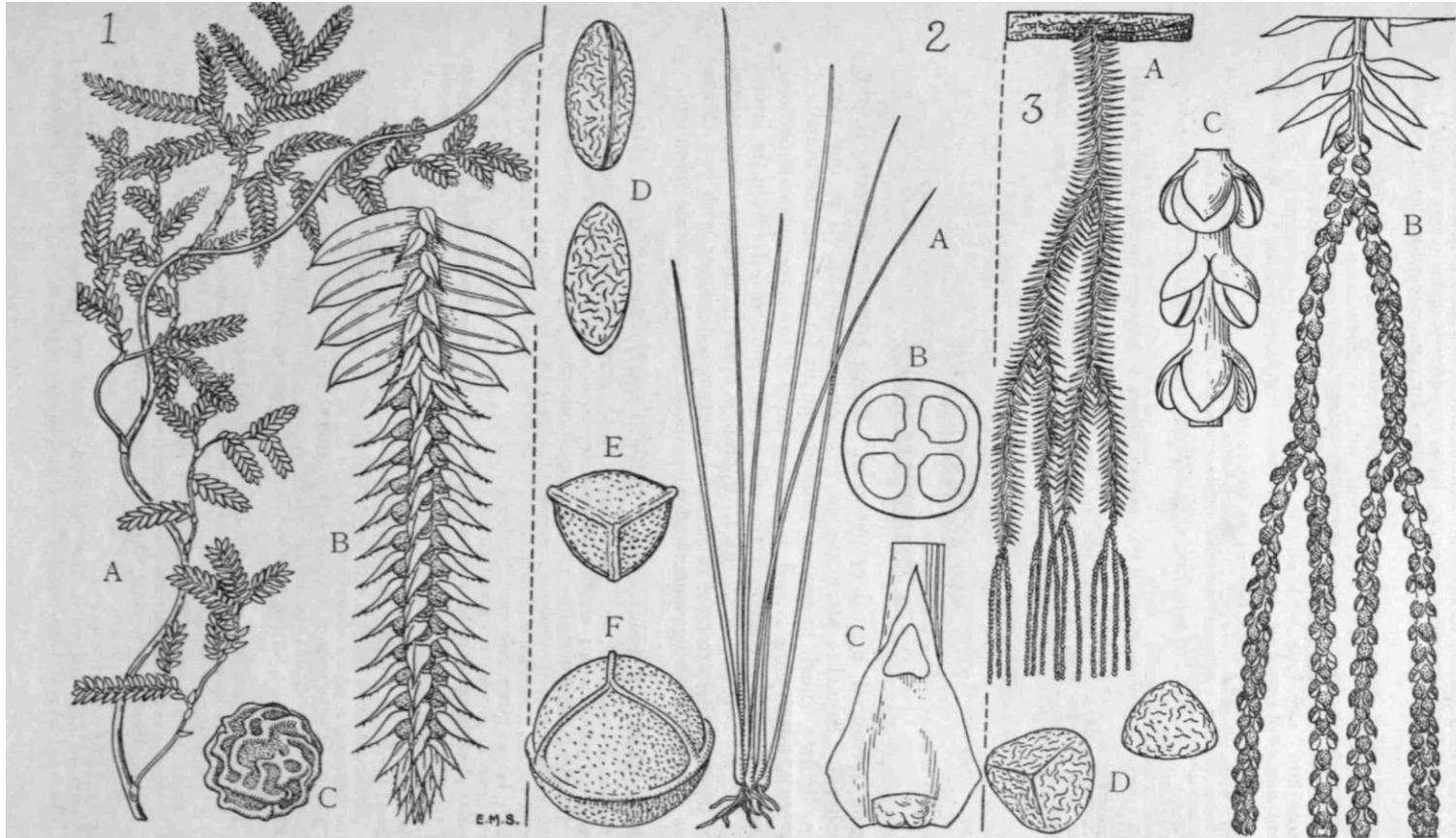


Fig. 1.—*Selaginella myosurus* (Sw.) Alston (Selaginellaceae).

A, habit, x 2/3. B, strobilus and leaves, x 6. C, spore, x 40. Drawn from Kalbreyer 47.

Fig. 2.—*Isoetes biafrana* Alston (Isoetaceae).

A, habit, x 1. B, T.S. of leaf, x 40. C, base of leaf showing sporangium, x 6. D, microspore, 30 $\mu$ . E, small megaspore, 425 $\mu$ . F, large megaspore, 575 $\mu$ . A, B, E & F, drawn from Keay FHI 28483 C & D from Guinea 2235.

Fig. 3.—*Lycopodium warneckeii* (Hert.) Alston (Lycopodiaceae).

A, habit, x 1/6. B, strobilus, x 1 1/2, portion of strobilus, x 6. D, spores, x c. 400. Drawn from Baldwin 13138.





## SELAGINELLES

### 3. SELAGINELLACEAE

Herbs, terrestrial, annual or perennial. Stems erect or prostrate, bearing rhizophores. Branches attenuate or dichotomous, usually all in one plane. Leaves ligulate, small, numerous, heteromorphous (at least on the branches), those of the lower plane lateral, spreading, those of the upper plane superficial, directed forwards; the leaves in the axils of the branches differ from the lateral leaves and are normally equal-sided. Sporangia borne in the axils of specialized leaves (sporophylls) arranged in strobili; sporangia dehiscent with two valves. Spores of two kinds, megaspores and microspores borne in separate sporangia.

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*SELAGINELLA* P. Beauv. — Bak. F. Allies 31 (1887); Sim F.S.A. 330 (1915).

- 1 Leaves spirally arranged, not dimorphous, linear, curved upwards, margins ciliate; apex with yellow seta; strobili tetragonous, terminal outer branches with uniform sporophylls; habit moss-like, creeping, much-branched *1. njamnjamensis*  
Leaves in four rows, dimorphous; apices not terminated by a seta: ----- 2
- 2 Stems twining, glabrous, straw-coloured, with distant leaves; lateral branches frond-like; leaves often with metallic sheen *2. myosurus*  
Stems erect or prostrate, never twining:----- 3
- 3 Stems pubescent, pink at base when dry, erect, with distant leaves; frond-like portion triangular; leaves often with metallic sheen *3. vogelii*  
Stems glabrous, not pink at base when dry: ----- 4
- 4 Sporophylls uniform: 5  
Sporophylls dimorphous:----- 9
- 5 Stems erect, or arching; lower third or two-thirds simple, with small leaves:  
6  
Stems prostrate; usually branched from the base and producing rhizophores at the nodes: ----- 7
- 6 Stems soboliferous, not rooting at tips; lateral leaves serrulate, with two false nerves; megaspores reticulate *4. versicolor*  
Stems not soboliferous, arching and rooting at tips; lateral leaves strongly ciliate at base, without false nerves; megaspores minutely papillose ----- *5. kalbreyeri*
- 7 Lateral leaves ciliate, often contiguous; stems angular: 8  
Lateral leaves denticulate, distant; stem (with leaves) about 7 mm. across; stems terete ----- *7. kraussiana*
- 8 Stem (with leaves) 4.5 mm. across; median leaves aristate, ciliate, lateral leaves ovate-oblong, subacute; base usually unbranched *5. kalbreyeri*  
Stem (with leaves) 2.5 mm. across; median leaves acuminate serrate; lateral leaves ovate, acuminate; branched from base ----- *6. cathedrifolia*
- 9 Stems soboliferous, erect, straw-coloured; frond-like portion oblong, light green; lateral leaves oblong, denticulate; megaspores papillose *8. abyssinica*

Stems not soboliferous:-----10

- 10 Median leaves obovate, aristate; stem straw-coloured or orange; lateral leaves oblong, distant, usually reflexed, often inrolled; microspores brownish-white 9.  
*soyauxii*

Median leaves ovate or ovate-lanceolate, acute or aristate; stem pale-straw-coloured; microspores vermilion (in mass) or orange:-----11

- 11 Aristae of median leaves greatly exceeding lamina; main stems (with leaves) nearly 1 cm. across; leaves elongate-oblong, rather stiff, those of branches overlapping  
*10. squarrosa*

Aristae of median leaves not exceeding lamina; main stems (with leaves) up to 5 mm. across:-----12

- 12 Stems irregularly dichotomous from the base; arista of median leaves less than half lamina; median leaves broadly ovate, denticulate; main stem creeping and rooting with filiform rhizophores; lateral leaves obliquely ovate, acute *11. buchholzii*

Stems regularly tripinnate, or quadripinnate, rarely pinnate (*S. subcordata*):-----13

- 13 Median and lateral leaves very strongly ciliate with cilia equal to nearly half the diameter of the leaves; lateral leaves contiguous or overlapping, cordate at base, subacute  
*12. blepharophylla*

Median leaves denticulate or shortly ciliate:-----14

- 14 Lateral leaves subcordate at base on the upper margin, overlapping the main stem: 15

Lateral leaves rounded at base on upper margin, produced at base on lower margin, not overlapping the main stem:-----16

- 15 Lateral leaves about 1 1/2 leaf-breadths apart; median leaves ovate, less than half as long as the lateral leaves *13. subcordata*

Lateral leaves about 1 leaf-breadth apart; median leaves elliptic-oblong, more than half as long as the lateral leaves  
-----14. protensa

- 16 Lateral leaves acute; arista of median leaves equalling lamina; stems branched from the base: 17

Lateral leaves obtuse:-----18

- 17 Lower sporophylls ciliate; megaspores reticulate *15. tenerrima*

Lower sporophylls ciliolate; megaspores minutely rugulose-tuberculate-----16. zechii

- 18 Lateral leaves widely spaced, up to 10 leaf-breadths apart towards the base of the main stem; median leaves shortly cordate, not strongly ciliate; lower sporophylls ciliate; microspores smooth *17. leoneensis*

Lateral leaves much closer, about 1 leaf-breadth between each:-----19

- 19 Median leaves shortly ciliate, long aristate; lateral leaves light green, spreading at 60 degrees *18. molleri*

Median leaves denticulate or shortly aristate or mucronate:-----20

- 20 Lower sporophylls ovate-triangular, not aristate; median leaves mucronate; lateral leaves light green, spreading at 60 degrees *19. thomensis*

Lower sporophylls ovate-lanceolate, aristate; median leaves aristate; lateral leaves dark green with metallic sheen, spreading at right angles-----20. molliceps

1. *Selaginella njamnjamensis* Hieron. in Hedwigia 39: 312 (1900); Tryon in Ann. Miss. Bot. Gard. 42: 52, t. 3 fig. 28 (1955).

Roux 2009: Accepted name

**Fr.Sud.:** Dantilla Chev. 744 (P). **Dah.:** on granite outcrops, where water lies, Savé Poisson (P). **S.Nig.:** Ado Bock, 18 miles S. of Iseyin, forming mats on bare granite, Keay & Brenan FHI 22431 (BM, K), Richards 5017 (BM).

Extends to Ubangi–Shari (Le Testu 4794, Tisserant 3587, Chev. 6668) and the southern Sudan.

2. *Selaginella myosurus* (Sw.) Alston in J. Bot. 72: 64 (1932).

Roux 2009: Accepted name

*Lycopodium myosurus* Sw. in Schrad. J. Bot. 1800, t. 2: 118 (1801).

*Stachygynandrum scandens* P. Beauv. in Magaz. Encycl. 5: 483 (1804); Fl. Oware 1: 10, t. 7 (1805).

*Selaginella scandens* (P. Beauv.) Spring (1843) — Kuhn Fil. Afr. 102; Bak. F. Allies 93 (1887); E. & P. Pflanzenfam. 1, 4: 707, fig. 407; Engl. Pflanzenw. Afr. 2: 79, t. 78 (1908); Knox in Trans. Ed. Bot. Soc. 35: 254, fig. 93 a & b (1950).

Climbing, up to 6 ft., in regrowth bush and on burned land; at low elevations up to 3,000 ft., in the wetter areas.

**Fr.G.:** Heudelot 790 (P); Karkandy Heudelot (ex Kuhn); Ziama Schnell 2733 (P), Portères (P); Kouria Nicklès (P); Nzo Schnell (P); Conakry Maclaud (P). **S.L.:** Afzelius (BM), Don (BM), Smeathmann (BM); Heddle's Farm Sc. Elliot 3920 (BM); Njala Deighton 2084 (BM); Sherbro Isl. Hunter (BM); Sugar Loaf Mt. T. S. Jones 349 (BM); Picket Hill T. S. Jones 355 (BM). **Lib.:** Monrovia Baldwin 13012 (BM), Dusen (P), Hauman (P); Port Marshall Knudsen 6 (BM); Nyaake, Webo Dist. Baldwin 6216 (BM); Zuie, Boporo Dist. Baldwin 12091 (BM); Suacoco Daniel 402 (BM). **Iv.C.:** Bingerville Abbayes 102 (BM, P), Portères 1556 (P), 2274 (P); Mt. Tonkoui, 3,500 ft. Abbayes 553 (BM, P), Makouié Chev. 16987 (P); Bouroukrou Chev. 16771 (P); Danané Schnell 1585 (P). **Ghana:** Axim Johnson 991 (K), Chipp 415 (K), Joly. (P); near Essiama Fishlock 87 (K), 110, 111 (K); Dixcove Box 2074 (BM); Tarkwa Vigne FH 4125 (K); Brenase Irvine 552 (K). **Togo:** Amedzofe Irvine 3373 (GC); Buem Mischlich (P). **S.Nig.:** Jamieson R., Sapoba Richards 3897 (BM), Meikle 529 (K); New–Town R., Warri Beauvois (BM, P); Ubièsi, Owerri Richards 3966 (BM); Mamu River F.R. Keay FHI 22299 (BM); Bonny Kalbreyer 47 (BM); Old Calabar Robb (BM). **Br.Cam.:** Bibundi Schlechter 12414 (BM); Ekundu N'dene Dusen (P). **F.Po:** Mann (BM); Musola Guinea 989 (BM).

Extends to Belgian Congo and Angola.(Fig. 1.)

3. *Selaginella vogelii* Spring in Mém. Acad. Belg. 24: 170 (1850); Hook. Sec. Cent. Ferns t. 86 (1861); Bak. F. Allies 100 (1887); Knox l.c. 278 (1950).

Roux 2009: Accepted name

*Selaginella dinklageana* Sadeb. in Jahrb. Hamb. Wiss. Anst. 14, Suppl. 16 (1897).

On ground or rocks in wet forests; sea level to 4,000 ft.

**Fr.G.:** Kindia to Conakry Schnell 110 (P); Nzo Schnell 545 (P), 583 (BM, P); Nimba Mts. Schnell 1403 (P); Gouée to Nzo Abbayes 598 (BM, P); Kakoulima Nicklès (K, P). **S.L.:** Benikoro Thomas 2948 (K); Giewahun Deighton 457 (K); Kono Fisher & Deighton 89 (K, NJ); Koflu Mt. Sc. Elliot 4614 (K);

Jau, Tunkia Deighton 5222 (NJ). **Lib.:** Mnanulu Baldwin 6059 (BM); Zuie Baldwin 12090 (BM); Sakimpa Harley F. 115 (BM); Bobei Harley F. 232 (BM); Sinoe Basin Whyte (K). **Iv.C.:** Makoiué Chev. 17060 (P); Dabou–Bago Joly 236 (P); Tai to Guiglo Abbayes 2060 (BM). **Ghana:** Axim Joly (P); Puso Puso Ravine Box 3258 (BM); Potroasi Adams 165 (BM); Akropong, Brown 332 Aquapim Hills Johnson 580 (K); Batika Irvine 480 (K); Abetifi Tschopp (K). **Dah.:** Poisson (P). **S.Nig.:** Okomu F.R. Brenan 56 (BM), Richards 857 (BM); Ehor & Ibekwe Fairbairn 16 (BM); Kwa Falls Richards 3991 (BM), 3995 (BM); Ijua, Obudu Savory & Keay FHI 25028 (BM); Aboabam Jones & Onochie FHI 18628 (BM). **Br.Cam.:** Cam. Mt. Johnston 144 (BM); Johann–Albrechtshöhe de Gironcourt 402 (P); Mopanya Kalbreyer 150 (BM); Nyasoso Stahl (P); Buea Rosevear 39/37 (BM), Dusen (P), Migeod 12 (BM), Brenan 4384 (BM). **F.Po:** Guinea 359 (BM), Mann (BM), 149 (K), 1406 (K), T. Vogel 182 (K), Barter 1398 (K), 2044 (K); Clarence Peak Barter (K).

Extends southwards to Angola (Gossweiler 5811).

#### 4. *Selaginella versicolor* Spring in Bull. Acad. Brux. 10: 143 (1843); Bak. F. Allies 84 (1887).

Roux 2009: Accepted name

*Selaginella nitens* Bak. in J. Bot. 23: 48 (1885); F. Allies 99 (1887).

On wet rocks especially near waterfalls or on forest floor in moderate shade, sometimes epiphytic; sometimes in fringing forest; sea level to 5,000 ft. alt.

**Fr.G.:** Landoumans Country Heudelot (P); Kindia Pobéguin (P), 1336 (P); Kouroussa Pobéguin 1057 (P); Nzo Schnell (P); Fouta Djallon to Ditinn Abbayes 876 (BM, P). **S.L.:** Picket Hill T. S. Jones 325 (BM), 326 (BM); York Pass Deighton 3327 (BM), 3328 (BM), 3329 (BM); Makump Deighton 1382 (BM, K); Baiima Deighton 3047 (BM, K); Gola Forest Deighton 459 (K); Mattru to Gbangbama Deighton 2340 (K). **Lib.:** Ganta Harley F. 231 (BM), F. 22 (BM), F. 23 (BM, K); Bilimu Harley F. 107 (BM, K), F. 197 (BM); Wohmen Baldwin 10098 (BM, K); Diebla Baldwin 6287 (BM); Kitomu Harley F. 160 (BM), F. 162 (BM); Bobei Village, base of Bili Mt. Winne 163 (BM); Bolahun Earthy 21 (BM). **Iv.C.:** Mt. Nimba Schnell 2894 (P), 5133 (P); Youkou Schnell 1656 (P), 1674 (P); Malamalasso Chev. 17525 (P); Mt. Tonkoui Abbayes 577 (BM), 224 (BM), 225 (BM); Tai to Guiglo Abbayes 2061 (BM).

**Ghana:** Bunsu Thompson (BM); Akrum waterfall, Begoro Box 2949 (BM); Puso Puso Ravine Box 3257 (BM), Adams 72 (BM), 89 (BM), 409 (K); Ninting Hill, Mampong Box 2904 (BM); Asiakwa Adams 191 (BM). **Togo:** Kling Falls Kersting A. 647 (P). **N.Nig.:** Dogon Kurmi Mutch & Latilo FHI 19949 (BM); Sanga River F.R. Keay FHI 22254 (BM); around Zungeru & Lokoja Lugard (K); forest between Gogo & Diede Elliott 78 (K). **S.Nig.:** Ibadan North F.R. Keay FHI 25358 (BM); Idanre Hills Keay FHI 25498 (BM), 22670 (BM), Richards 3823 (BM); Aboabam Keay FHI 28231 (BM); British Obokum Keay FHI 28283 (BM). **Br.Cam.:** Buea Rosevear 40/37 (BM), 38/37 (BM), Dusen (P), Deistel 475 (P); Victoria–Kumba road Brenan 4068 (BM); Mamfe Rosevear (BM); Wum Escarpment Savory 351 (BM); Bafut, Bamenda Savory 293 (BM); Johann–Albrechtshöhe Staudt 468 (K, P), 515 (K, P), 516 (K, P). **F.Po:** Mann 149 (K); Ureka Thorold 33 (BM); Moka Exell 794 (BM).

Extends to Angola and to Nyasaland, the Sudan (Macleay 475) and Uganda.

#### 5. *Selaginella kalbreyeri* Bak. in J. Bot. 22: 276 (1884); F. Allies 77 (1887).

Roux 2009: Accepted name

On wet rocks in shade, mostly at higher elevations; up to 2,500 ft. alt.

**Fr.G.:** Nzo Schnell 1752 (P); Zياما Portères (P); Mt. Kakoulima Abayyes 341 (BM). **Lib.:** Sanokwele Baldwin 13133 (BM); Bahn Harley 123 (BM). **Iv.C.:** Mt. Tonkoui Abbayes 573 (BM, P), 577 (BM, P); Séguéla Abbayes 517 (BM, P). **Togo:** Misahöhe Baumann 43 (B). **S.Nig.:** Idanre E. W. Jones 3806 (BM). **Br.Cam.:** Likomba Kalbreyer 164 (BM); Buea Dusen (P); Mopanya Kalbreyer 164 (K).

6. *Selaginella cathedriformis* Spring in Mém. Acad. Belg. 24: 112 (1850); Bak. F. Allies 40 (1887); Knox l.c. 261, fig. 117 a & b.

Roux 2009: Accepted name

On rocks and banks, especially by streams in wet forest, up to 4,500 ft. alt.

**Fr.G.:** Gouée to Nzo Abbayes 619 (BM, P); R. Miyen, Nzo Schnell 805 (P); Ziama Schnell 2664 (BM).

**S.L.:** Njala Deighton 646 (BM, NJ); Grahun to Bokobu Deighton 3649 (NJ); Kambui Hills, Neaboi Small 892 (NJ); Kenema Deighton 5225 (NJ), 8224 (NJ). **Lib.:** Kitomu Harley F. 154 (BM); Ganta Harley F. 19 (BM); Duo Baldwin 11339 (BM); Mnanulu Baldwin 6025 (BM); Jaurazon Baldwin 11452 (BM). **Iv.C.:** Gouée Abbayes 601 (BM, P); Danané Schnell 1329 (P); Nimba Mts. Schnell (P); Malamalasso Chev. 17524 (P), 17528 (P); Assinie Chaper (P). **Ghana:** Fishlock 45 (K.); Princes R. Burton & Cameron (K); Tomonto–Ancobra Johnson 987 (K); Axim Cudjoe 76 (BM); Bonsa–Tarkwa road Johnson 988 (K), 989 (K). **S.Nig.:** Calabar–Mamfe road Baldwin 13764 (BM), 13779 (BM); Kwa Falls Richards 3994 (BM), Maggs 156 (BM). **Br.Cam.:** Munanya road Adams 1335 (BM); Ndian Dusen (P).

Widespread in western Africa, south to Angola and in Principe.

7. *Selaginella kraussiana* (Kunze) A. Br. Ind. Sem. Hort. Berl. 1860, App. 22; Bak. F. Allies 65 (1887); Sim F.S.A. 335, t. 182, fig. 1 (1915); Knox l.c. 291, fig. 188 (1950).

Roux 2009: Accepted name

*Lycopodium kraussianum* Kunze (1844).

*Selaginella azorica* Bak. (1883).

On ground in mossy forest zone on mountains, 3,200 to 6,000 ft. alt.; locally abundant.

**Br.Cam.:** Buea Migeod 23 (BM), Rosevear (BM), Box 3609 (BM), Brenan 4385 (BM); Ukike, Mann's Spring Richards 4358 (BM). **F.Po:** Pico Serrano Guinea 2018 (BM); Ilache waterfall Adams 1080 (BM).

Ranges throughout S. Africa and the highlands of E. Africa, also in the Azores.

8. *Selaginella abyssinica* Spring in Mém. Acad. Belg. 24: 99 (1850); Bak. F. Allies 84 (1887); Knox l.c. 263, fig. 128 (1950).

Roux 2009: Synonym of *Selaginella goudotiana* Spring var. *abyssinica* (Spring) Bizzarri

*Selaginella preussii* Hieron. in E. & P. Pflanzenfam. 1, 4: 686, No. 161 (1901); in Hedwigia 41: 197 (1902).

*Selaginella bueensis* Hieron. in Hedwigia 43: 20 (1904).

*Selaginella molliceps* of Sim F.S.A. 339, t. 183 (1915).

On wet rocks, especially near waterfalls, in forest from low levels to 8,000 ft. alt.

**Br.Cam.:** Buea Preuss (P, K), 978 (P), Dusen (P). **F.Po:** Clarence Peak Mann 667 (K); Mioko Heights Adams 1104 (BM); Ilache waterfall Adams 1067 (BM).

Also in French Cameroons (de Gironcourt 495, 545, Nicklès 51), and eastern African highlands from Eritrea to S. Rhodesia.

9. *Selaginella soyauxii* Hieron. in E. & P. Pflanzenfam. 1, 4: 697 (1901); in Hedwigia 43: 57 (1904).

Roux 2009: Accepted name

Wet shaded rocks and banks in forest, mostly in lower montane zone.

**Fr.G.:** Haut Eonkouri Pobéguin 1472 (P); Macenta Chabanaud (P). **S.L.:** Mattru to Gbangbama Deighton 2341 (K, NJ); Jau, Tunkia Deighton 5221 (BM, NJ); Grewahun Deighton 458 (K, NJ). **Lib.:** Bolahun Earthy (BM); Arthington Falls Büttner (P); Bilimu Harley 2098 (BM). **Iv.C.:** Schnell 1585 (P); Mt. Tonkoui Schnell 1746 (P), Abbayes 230 (BM); Nimba Mts. Schnell (P). **Dah.:** Porto Novo Èttèvé 15 (P). **Br.Cam.:** Cam. Mt. Rosevear (BM); Mopanya Kalbreyer 102 (BM); Buea Migeod 6 (BM) Dunlap 143 (K); Bafut, Bamenda Savory UCI 295 (BM). **F.Po:** Musola Guinea 1313 (BM).  
Extends south to Gabon and east to Uganda (Milburn 3).

10. *Selaginella squarrosa* Bak. in J. Bot. 23: 180 (1885); F. Allies 113 (1887).

Roux 2009: Accepted name

Wet forests up to 4,000 ft. alt.

**Br.Cam.:** Cam. Mt. Mann 1407 (K).  
Also in French Cameroons (Nicklès 103) and Spanish Guinea (Mann 1648).

11. *Selaginella buchholzii* Hieron. in E. & P. Pflanzenfam. 1,4: 696 (1901); Hedwigia 43: 51 (1904), incl. var. *togoensis* Hieron.

Roux 2009: Accepted name

Cracks in rocks, among stones, or on banks, under bushes or in dry exposed positions; near sea level up to 3,000 ft. alt.

**S.L.:** Musaia, Dembelia Small 271 (BM, NJ). **Iv.C.:** Vavoua Abbayes 167 (BM). **Ghana:** Achimota Foote 156 (BM), Milne–Redhead 5135 (BM); Ejura Scarp Adams & Akpabla Ghana 4525 (BM). **Togo:** Kpeme, N. of Kpandu Adams 1813 (BM); Sokode Schröder (B, P). **S.Nig.:** Lagos Schilling (B); Ibadan Meikle 1003 (BM, K); Orosun, Idanre Hills Keay FHI 25522 (BM); Agulu Keay FHI 25288 (BM); Enugu Baldwin 13795 (BM).  
Extends south to Gabon and east to Ubangi (Le Testu 2090) and Belgian Congo (Vanderyst 13031).

12. *Selaginella blepharophylla* Alston in Mém. I.F.A.N. 50: 40 (1957).

Roux 2009: Accepted name

On wet roadside banks in secondary forest.

**Fr.G.:** Ouéta, Nzérékoré Schnell 2766 (P). **Lib.:** Kitomu Harley 156 (BM); Sanokwele Baldwin 13132 (BM); Ganta Harley F. 137 (BM). **Iv.C.:** Nimba Mts. Schnell (P); Haut–Cavally Pobéguin 59 (P), 60 (P); Fort Binger & Coala Chev. 19542 (P).

13. *Selaginella subcordata* A. Br. ex Kuhn Fil. Afr. 193 (1868); Bak. F. Allies 119



(1887).

Roux 2009: Accepted name

On ground, sometimes on vertical cuttings, in gardens, savannah, on rocks and walls in shade, sometimes in fringing forest; sea level to 3,900 ft. alt.

**Fr.Sud.:** Toukoto Chudeau (P); Koulikoro Chev. 2934 (P). **Fr.G.:** Gouée Abbayes 599 (BM, P); Dalaba, Fouta Djallon Abbayes 814 (BM); Kouroussa Pobéguin (P). **S.L.:** Freetown Welwitsch 3 (BM), Lewis (BM); York Deighton 3292 (BM, NJ); Hill Station Deighton 528 (K); Njala Deighton 3087a (BM, NJ). **Lib.:** Jamesville Harley F. 209 (BM); Tawata Baldwin 10348 (BM). **Iv.C.:** Mt. Tonkoui Schnell 1733 (P), Abbayes 231 (BM).

Also in Ubangi (Tisserant 3609).

14. *Selaginella protensa* Alston Mém. I.F.A.N. 50: 41 (1957).

Roux 2009: Accepted name

On rocky ground 4,500 ft. alt.

**Iv.C.:** Nimba Mts. Schnell 4384 (P); Ravin de Zongue, Nymba Portères (P).

15. *Selaginella tenerrima* A. Br. ex Kuhn Fil. Afr. 193 (1868); Bak. F. Allies 119 (1887).

Roux 2009: Accepted name

Wet shaded rocks, near sea level.

**Fr.G.:** Kouyeya, N. of Kindia Nicklès (P); Kouria Nickles (P). **Fr.Sud.:** Bamako Waterlot 1480 (P); Tabacco, Haut Senegal Chev. 2936 (P). **S.Nig.:** British Obokum Keay FHI 28281 (BM). **Br.Cam.:** Metschum Falls, Bamenda Savory 313 (BM).

Also in Ubangi (Tisserant 2788) and Angola.

16. *Selaginella zechii* Hieron. in E. & P. Pflanzenfam. 1, 4: 697, No. 298 (1901); Hedwigia 43: 55 (1904).

Roux 2009: Accepted name

On wet rocks and banks in dense forest, up to 1,200 ft. alt.

**Fr.G.:** Boule Col, Macenta Schnell 125 (BM); Konkouré Pobéguin 1894 (P); Bossou, Nzérékoré Schnell 1424 (P). **Ghana:** Kibi Box 3506 (BM). **Togo:** Kete Krachi Zech 388 (B); Lome Herb. Christ (P).

17. *Selaginella leoneensis* Hieron. in E. & P. Pflanzenfam. 1, 4: 697(1901); Hedwigia 43: 54 (1904).

Roux 2009: Accepted name

On the ground or rocks, especially on banks in forest, up to 1,400 ft. alt.

**Fr.G.:** Kakoulima Nicklès (P). **S.L.:** Lane–Poole 436 (NJ); York Pass Deighton 3330 (BM, NJ), 3326 (NJ), 3331 (BM, NJ); Picket Hill T. S. Jones 324 (BM); Sugar loaf Mt. T. S. Jones 346 (BM, NJ); Loma Mts. Jaeger 679 (NJ). **Lib.:** Kitomu Harley F. 161 (BM); Bilimu Harley 2099 (BM). **Iv.C.:** Youkou Schnell 1676 (P); Bettié Bas Comoè Chev. 17550 (P); Memba Forest, Abidjan Abbayes 293 (BM, P); Télcé Forest, Abidjan Abbayes 295 (BM, P); Yapo Forest, Abidjan Abbayes 258 (BM, P).

**S.Nig.:** Idanre Hills, Keay FHI 22669 (BM), 25497 (BM), 25499 (BM), Richards 3805 (BM), 3852 (BM), Savory 41 (BM); Abakaliki Baldwin 13811 (BM); Balinge to Ikwette Savory & Keay FHI 25157 (BM).

**Br.Cam.:** Mile 44, Bamenda Road, Mamfe Keay FHI 28546 (BM); Johann–Albrechtshöhe Staudt 452 (K, P); Bafut, Bamenda Savory 294 (BM).

18. *Selaginella molleri* Hieron. in E. & P. Pflanzenfam. 1, 4: 697 (1901); Hedwigia 43: 52 (1904).

Roux 2009: Accepted name

On mossy rocks under bushes about 3,000 ft. alt.

**S.Nig.:** Orosun, Idanre Hills Keay FHI 25516 (BM), 25522 (BM).

Also on **S. Tomé**.

19. *Selaginella thomensis* Alston in Exell Cat. S. Tomé 97, fig. 3 (1944).

Roux 2009: Accepted name

On wet rocks.

**S.L.:** Purdie (BM); York Adames 205 (BM). **S.Nig.:** Kwa Falls, Calabar Richards 4005 (BM).

**Br.Cam.:** N'dian Dusen (P).

Also on **S. Tomé**.

20. *Selaginella molliceps* Spring in Mém. Acad. Belg. 24: 257 (1850); Bak. F. Allies 120 (1887), partly.

Roux 2009: Accepted name

*Selaginella rubricaulis* Hort. (1859).

On moist laterite banks or boulders in forest; up to 2,000 ft. alt. The stems are reddish purple when fresh but dry a greenish straw colour.

**Fr.G.:** Massif de Ziama Schnell 2686 (P); Ditinn, Fouta Djallon Abbayes 867 (BM, P); Gouée Bridge Abbayes 600 (BM, P); Bamakama Schnell (P). **Lib.:** Tappita Baldwin 9103 (BM); Diebla Baldwin 6288 (BM). **Iv.C.:** Téké Forest Abbayes 296 (BM); Nimba Mts. Schnell 2897 (P); Dans Massif Schnell 59 (P), 60 (P), 1324 (P). **Ghana:** Mpesem F.R. Cudjoe 36 (K); Foso–Juaso F.R. Box 2487 (BM), Schnell 251 (BM); Kakum F.R. Box 2855 (BM), 2862 (BM), 2915 (BM), 2919 (BM), 2935 (BM); Kibi Johnson 506 (K); Puso Puso Ravine Box 3256 (BM); Potroasi Adams 183 (BM); Aburi Thompson (BM). **Togo:** near Fomana Box 2912 (BM). **S.Nig.:** Aboabam Keay FHI 28232 (BM); Ehor & Ibekwe Fairbairn 8 (BM); Kwa Falls, Calabar Richards 4006 (BM). **Br.Cam.:** Barombi Preuss 305 (BM); Johann–Albrechtshöhe Staudt 452 (P); Man o' War Bay Schlechter 12392 (BM); Banga, S. Bakundu F.R. Richards 4028 (BM). **F.Po:** Mt. Balea Guinea 495 (BM); Ureka Thorold 33a (BM).

Extends south to Belgian Congo and Angola.

# PSILOPSIDA

## PSILOTALES<sup>4</sup>. PSILOTACEAE

Epiphytic perennial herbs; rootless with dichotomous mycorrhizal rhizomes. Stems erect (in W. African species), photosynthetic, green, angular, dichotomous. Leaves represented by minute subulate, scale-like, spirally arranged appendages. Sporangia united in threes to form a synangium; synangia borne at the base on the upper surface of 2-lobed sporophylls (or perhaps axes). Spores bean-shaped, monolete, homosporous. Gametophytes elongate cylindrical, irregularly dichotomous, mycorrhizal, clothed with yellow-brown rhizoids. Gametophytes monoecious with antheridia and archegonia irregularly scattered over the surface; antheridia spherical projecting; archegonia sunken with short projecting necks; antherozoids spiral, multiciliate.

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*PSILOTUM* Sw. — Bak. F. Allies 30 (1887); Sim F.S.A. 341 (1915).

Erect epiphyte 15–30 cm. high, branched from above the middle; branches 1 mm. in diam.; leaves less than 1 mm. long; synangia 2 mm. in diam.

*Psilotum nudum* (Linn.) Griseb. in Abh. Ges. Wiss. Götting. 7: 278 (1857); Engl. Pflanzenw. Afr. 2: 76, fig. 75 (1908).

Roux 2009: Accepted name

*Lycopodium nudum* Linn. Sp. Pl. 2: 1100 (1753).

*Psilotum triquetrum* Sw. Syn. Fil. 187 (1806); Kuhn Fil. Afr. 187 (1868); Bak. F. Allies 30 (1887); Hook. & Bauer Gen. Fil. t. 87 (1841); Sim F.S.A. 342, t. 18; fig. 2 (1915); Pitot in Bull. I.F.A.N. 12: 315, fig. (1950); Adams & Alston in Bull. Brit. Mus. 1: 185 (1955); Harley in Contr. Gray Herb. 177: 98 (1955).

Among adventitious roots of oil and coconut palms; at sea level to 4,000 ft.

**Sen.:** Perrottet 727 (Kuhn); Sangalkam, Niayes Pitot (IFAN). **Lib.:** R. Cess, Grand Bassa Baldwin 11277 (ex Harley). **Ghana:** Aburi Johnson 214 (GC). **N.Nig.:** Vom, Jos Plateau Dent Young 272 (K).

**S.Nig:** 10 miles E. of Lagos Savory 133 (BM); Ogoya, Kuramo water, Lagos Richards 5084 (BM).

Also in Cape Verde Is. (ex Chev.), S. Tomé and tropics generally, including many remote islands (e.g. Ascension).

# PTEROPSIDA

## OPHIOGLOSSALES 5. OPHIOGLOSSACEAE

Terrestrial, rarely epiphytic (none in W. Africa) herbs. Leaves few or solitary, simple (*Ophioglossum*) or decompound (*Botrychium*) with a sterile foliaceous segment and fertile non-foliaceous dorsal segment, arising from a common stipe; fertile segments simple, linear (*Ophioglossum*), or compound. Sporangium thick-walled, without annulus, dehiscing by a slit into 2 valves. Gametophytes subterranean, fleshy, mycorrhizal, some species densely covered with rhizoids, others glabrous or glabrescent when old, ovoid, linear, stellate or cylindrical in form; branching irregular; normally monoecious; antheridia sunken and slightly projecting.

- 1 Sterile segment of leaf simple, veins anastomosing; fertile segment spike-like with a row of immersed sporangia on each side *1. Ophioglossum*  
Sterile segment of leaf decompound, veins free; fertile segment paniculate with globose sporangia, which are not immersed ----- *2. Botrychium*

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### 1. *OPHIOGLOSSUM* Linn. — Sim F.S.A. 318 (1915); Copel. Gen. 11 (1947).

- 1 Rhizome bulbous; leaves with an apparent costa formed by elongated meshes of the venation, oblong-elliptic, obtuse or subacute; petiole about equalling lamina; fertile lobe much longer than sterile lobe *1. costatum*

Rhizome cylindrical, erect: ----- **2**

- 2 Leaves elliptic or ovate: **3**

Leaves linear, usually 2, 1–3 mm. broad, with the median veins more developed than the lateral and about 3 rows of elongate areoles on either side; without free veinlets; lamina 1–1.5 cm. long, about 2 mm. broad; epidermal cells elongate with parallel or flexuose walls; stomata 50–60 $\mu$  long, with guard cells parallel to the costa; sporangia 4–9-jugate; spores 40 $\mu$ , with 6–8 angular, rather conspicuous areoles ----- *5. gramineum*

- 3 Petiole long, up to 12.5 cm. above ground; leaves cordate or cuneate at base, 1–2; median vein flexuose, indistinct; areoles wide, with many included free veins; epidermal cells of undersurface almost equal-sided, with flexuose margins; stomata 65–80 $\mu$ , those on both surfaces irregularly disposed; sporangia 17–45-jugate; spores 30 — 35 $\mu$ , with 20 shallow areoles to the diameter *2. reticulatum*

Petiole short, subterranean; leaves not cordate at base: ----- **4**

- 4 Petiole up to 1.8 cm.; leaves usually 2, elliptic, acute, 1–2 cm. long, 5 mm. broad; median vein almost straight, laterals forming a few large areoles with included free veins; epidermal cells of upper surface elongate with parallel or flexuose walls; stomata 60–80 $\mu$ , with guard cells parallel to the costa; sporangia 8–10-jugate; spores 40 $\mu$ , with 12 rather conspicuous areoles to the diameter *3. gomezianum*

Petiole about 3 mm.; leaves usually one only, oblanceolate to elliptic, subacute; veins few, anastomosing; sporangia 2–6-jugate; spores 50–70 $\mu$  ----- *4. thomasi*

1. *Ophioglossum costatum* R. Br. Prod. Fl. N. Holl. 163 (1810); Tard. in Mém. I.F.A.N. 28: 21, t. 1, fig. 1 (1968); Pic.–Ser. in Webbia 9: 626, fig. 1 (1954).

Roux 2009: Accepted name

*Ophioglossum fibrosum* Schum. Vid. Selsk. Afh. 4: 226 (1829); Pranti in Eichl. Jahrb. K. Bot. Gart. Berl. 3: 325, t. 8, fig. 28 (1884); Maheshwari & Singh in Journ. Ind. Bot. Soc. 3: 103, t. 1, fig. 45 (1934); Chakravarty in Bull. Bot. Soc. Bengal 5: 10, fig. 3 (1951).

*Ophioglossum brevipes* Bedd. Fern S. Ind. 23: t. 72 (1863).

*Ophioglossum aphrodisiacum* Welw. ex Hook. Syn. Fil 446 (1868).

*Ophioglossum felixii* Tard. in Notulae Syst. 13: 169 (1948).

*Ophioglossum pedunculatum* of Clausen in Mem. Torr. Bot. Club 19: 140 (1938); Demaret in Bull. Jard. Bot. Brux. 19: 260 (1949).

Depressions in damp sandy ground, often overlaying rocks in open among short grass.

**Fr.Sud.:** Koudougou to Dendée Chev. 953 (K). **Fr.G.:** Jac–Fél. 7501 (P). **S.L.:** Kambia Jordan 296 (K, NJ); Rolip, Sanda–Tenraron Jordan 538 (K). **Lib.:** Mt. Barclay Bunting (BM). **Iv.C.:** Dialokoro to R. Bère Chev. 24963 (BM). **Ghana:** Kpeshi Lagoon Adams 341 (BM, K); Frederiksberg Thonning (ex Schum.); Navrongo Vigne FH 4608 (K); Djowany, Gambaga Dist. Akpabla 669 (K). **N.Nig.:** Naraguta, Jos Keay FHI 20058 (BM); Anara F.R., Zaria Prov. Keay FHI 22880 (BM), 25976 (BM, K); near Kargi Hill, Birnin Gwari Keay FHI 25882 (BM, K); Katagum Dist. Dalz. 246 (K); Jebba Barter (K); Lokoja Barter (K); Nupe Barter 1445 (K). **S.Nig.:** Oke–Iho, Iseyin Savory 253 (BM); Bendi Jones & Onochie FHI 18997 (BM).

Tropical Africa and Asia.

2. *Ophioglossum reticulatum* Linn. Sp. Pl. 2: 1063 (1753); Hook. Syn. Fil. 446 (1868), partly; Prantl in Eichl. Jahrb. K. Bot. Gart. Berl. 3: 330, t. 8, fig. 32 (1884); Sim F.S.A. 322, t. 167, fig. 2 (1915); Clausen in Mem. Torr. Bot. Club 19: 130 (1938).

Roux 2009: Accepted name

*Ophioglossum vulgatum* var. *reticulatum* (Linn.) Luer. in Journ. Mus. Godefr. 8: 18, 19, t. 15, fig. 115–118, t. 16, fig. 128–130 (1875).

Mostly in open ground on damp, sandy soil; up to 4,500 ft. alt.

**S.L.:** Kabala Glanville 255 (K, NJ). **Lib.:** Mt. Barclay Bunting 1 (BM); 12 miles inland from mouth of Cess R. Baldwin 11245 (BM). **Ghana:** Cape Coast Don (BM); Asuansi Box 2053 (BM), Scholes 170 (K). **N.Nig.:** Kakangi F.R., Zaria Prov. Keay FHI 25938 (BM, K); Anara F.R., Zaria Prov. Keay FHI 19191 (BM); Abinsi Dalz. 793 (K); Gaya, Rura, Kano Daggash FHI 22389 (K); Vom, Jos Plateau Dent Young (K). **S.Nig.:** Ibadan Fuel Plantation Keay (BM); Oke–Iho, Iseyin Savory UCI 256 (BM); Ikoneto, Old Calabar Milne (BM); Kataban, Afi River F.R., Jones & Onochie FHI 18942 (BM).

**Br.Cam.:** Obang village, Bamenda Ujor FHI 30086 (K); Bopo to Banga, S. Bakundu F.R. Richards 4051 (BM, K); Ngusi to Nafusa Schlechter 12903 (BM, K); Cam. Mt. Mann 2061 (K); Victoria Maitland 86 (K). **F.Po:** Km. 35, road to Gran Carlos Guinea 683 (BM, K); Moka Exell 768a (BM); top of Clarence Peak Mann 666 (K).

Tropics generally.

3. *Ophioglossum gomezianum* **Welw. ex A. Br. var. gomezianum** — in Kuhn Fil. Afr. 178 (1868); Hook. Syn. Fil. 445 (1868); Prantl in Eichl. Jahrb. K. Bot. Gart. Berl. 3: 315, t. 7, fig. 13 (1884); Engl. Pflanzenw. Afr. 2: 69, fig. 67D (1908).

Roux 2009: Synonym of *Ophioglossum gomezianum* Welw. ex A.Braun

*Ophioglossum vulgatum* **var. lusitanica** of Luer. in Journ. Mus. Godefr. 8: 18, 19, t. 14, fig. 98–100, t. 18, fig. 139 (1878).

*Ophioglossum nudicaule* **vars. typicum and tenerum** (Mett.) Clausen in Mem. Torr. Bot. Club 19: 144 & 146 (1938).

*Ophioglossum ammophilum* Adams in Ann. & Mag. Nat. Hist. ser 12, 7: 874 (1954).

Among short grass in peaty soil overgrowing rock.

**IV.C.:** Makono Abbayes 142 (BM). **Ghana:** Winneba Plain Adams 308 (BM); Kpeshi Lagoon, Labadi Adams 2724 (BM). **S.Nig.:** Bateria, Afi River F.R., Jones & Onochie FHI 18986 (BM). **F.Po.:** Barter (BM) 1363 (K).

Also in Ubangi (Le Testu 2728), the Sudan (Prowse 121) and Angola.

3a. *Ophioglossum gomezianum* **var. latifolium** Prantl in Eichl. Jahrb. K. Bot. Gart. Berl. 3: 316 (1884); Brause in Deutsch. Zentr.-Afr. Exp. 1907–8, 2: 38 (1910).

Roux 2009: Synonym of *Ophioglossum latifolium* (Prantl) J.E.Burrows

Leaves nearly as broad as long.

**S.L.:** Kambia, Magbema Jordan 449 (BM, K, N J). **Ghana:** Pepiase, Kwahu Adams 2407 (BM).

**N.Nig.:** Mile 5 on Jos Road, Anara F.R., Keay FHI 22914 (BM). **S.Nig.:** Oke-Iho, Iseyin Savory UCI 254 (BM).

**Br.Cam.:** Fako Plateau, near Mann's Spring Mildbr. 3406 (ex Mildbr.).

Also in Angola.

4. *Ophioglossum thomasi* Clausen in Mem. Torr. Bot. Club 19: 152 (1938); Tard. l.c. 28: 22 (1953).

Roux 2009: Accepted name

On wet gravelly soil.

**IV. C:** Km. 15 on Béoumi Road, Séguéla Abbayes 157 (BM). **Ghana:** Labadi Adams 2748 (BM).

Also in Uganda.

5. *Ophioglossum gramineum* Willd. in Schrift. Akad. Erfurt 1802: 18, t. 1, fig. 1 (1802); Clausen in Mem. Torr. Bot. Club 19: 161 (1938), partly; Prantl in Eichl. Jahrb. K. Bot. Gart. Berl. 31: 311, t. 7, fig. 4 (1884); Engl. Pflanzenw. Afr. 2: 69, fig. 67B (1908); Tard. in Mém I.F.A.N. 28: 22, t.1, fig. 6–7 (1953).

Roux 2009: Accepted name

**Ghana:** Ejura Morton (GC) 9828 (BM).  
**Also in Angola, Ubangi-Shari and S. India.**

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2. *BOTRYCHIUM* Sw. — Copel. Gen. 12 (1947).

Habit similar to *Ophioglossum* but sterile segments of frond more or less compound and pinnately or bipinnately divided; fertile segments erect, paniculate; sporangia globose, not immersed, horizontally dehiscent.

*Botrychium chamaeconium* Bitter & Hieron. in Engl. Nat. Pflanzenfam. 1, 4: 471 (1900); Hook. Ic. Pl. t. 3235 (1934); Clausen in Mem. Torr. Bot. Club 19: 106 (1938); Tard. in Mém. I.F.A.N. 28: 23, t. 1, fig. 10 (1953).

Roux 2009: Accepted name

**Br.Cam.:** Buea, 6,600 ft., in fissures of steep rock slope in gorge Preuss 1037 (ex Bitter); Bambui, Bamenda, epiphyte on tree trunk in wood, 6,300 ft. Adams 1560 (BM).  
**Also in Uganda and Sudan (Macleay 55).**

## MARATTIALES



## 6. MARATTIACEAE

Robust perennial herbs with fleshy mycorrhizal roots and multicellular root hairs. Rhizomes short massive erect trunks, covered with persistent stipules; leaf-traces with complex steles. Fronds bipinnate (in W. African species). Sporangia thick walled, closely united into synangia (in W. African species); synangia splitting to expose the ventral face of the sporangia, each opening by a ventral longitudinal slit. Spores minute. Gametophytes deep-green, thalloid mycorrhizal, monoecious; antheridia large and sunken.

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**MARATTIA** Sw. (1788) –Sim F.S.A. 317 (1915); Copel. Gen. 15 (1947).

**1** Stipes spinulose, about 45 cm. long, with spines nearly 0.5 mm. long; lamina about 30 cm. long with only 4 pairs of pinnae on either side; synangia small, near the margin and sometimes extending into the base of the teeth near the apices of the pinnules; pinnules pedicellate with pedicels over 1 mm. long, cuneate at base, parallel-sided, closely serrate, gradually tapering *I. odontosora*

Stipes smooth or minutely spinulose; much larger plants with fronds up to 4 m. long; sori intramarginal; pinnules subsessile rounded or cuneate at base, often broadest in the middle, subentire or serrate, usually abruptly caudate **2.**  
*fraxinea*

**1. *Marattia odontosora*** Christ in Journ. de Bot. sér. 2, 2: 19 (1909).

Roux 2009: Synonym of *Marattia fraxinea* Sm.

Common above 2,000 ft. in the Fouta Djallon area, also on Bintumane.

**Fr.G.:** Diaguissa to Timbo Chev. 13445 (P); Labé Chev. 12285 (P); Ditinn Gorge, Dalaba Caille 1 (P); Bomboli, Fouta Djallon Pobéguin 2243 (P); Zogue Ravine, Nimba Mts. Portères (P). **S.L.:** Bintumane 3,200 ft. T. S. Jones 15 (BM).

**2. *Marattia fraxinea*** Sm. PL. Ic. Ined. 2: t. 48 (1790).

Roux 2009: Accepted name

Dark, shaded damp gullies in rook 2,000 to 7,000 ft. alt.

**Fr.G.:** source of the Niger Jaeger 102 (NJ); Dalaba to Diaguissa Chev. 12654 (K), 12278 (K). **S.L.:** Makali Deighton 4071 (NJ); Neaboi valley, Kambui Hills Small 890 (BM, K, NJ); Makombe, Kunike Sanda Deighton 4079 (BM, N J); Kafogo Sc. Elliot 5646 (K). **Lib.:** Ganta Harley 34 (BM, K); Bilimu Harley 69 (K); Bumbuma Linder 1328 (K); Du R. Linder 250 (K); Mt. Bili Barker 1173 (K); Gbanga Linder 455 (K). **IV.C.:** between R. Agnéby and R. Bia Rousseau (K); Cavally Basin Chev. (P); Téké Forest, N. of Abidjan Abbayes 359 (BM). **Ghana:** Bompata Vigne FH 2715 (K); Tarkwa Fishlock 88 (K); Tano–Ofin F.R., Lyon 112 (K); Dompem Chipp 47 (BM, K); R. Kakum, Asuansi Box 2885 (BM); Puso Puso Ravine, Kibi Mts. Box 3262 (BM), 3462 (BM), Scholes 448 (BM), Usher 6 (BM). **S.Nig.:** Okomu F.R., Richards 3634 (BM, K); Aboabam Keay FHI 28176 (BM, K); Oban Talbot (BM); Sonkwala, Obudu Savory & Keay FHI 25031 (BM). **Br.Cam.:** Babanki Road, Mile 13 Savory UCI 281

(BM); W. Ekona A. W. Hill (K); Cam. Mt. Johnston 149 (BM, K), Dunlap 68 (K), Mann (K), Migeod 37 (BM, K); Johann–Albrechtshöhe Staudt 645 (BM, K); near Mimbria Richards 4376 (BM, K); above Bamenda Migeod 483 (BM, K), Rosevear (BM). **F.Po:** Barter (K), Mann 131 (K).

Extends southwards to Angola and eastwards to Uganda, also in Mascarene Islands; the plant of S.E. Africa is *M. salicifolia* Schrad.

## FILICALES7. OSMUNDACEAE

Terrestrial ferns with suberect rhizomes, clothed with persistent leaf-bases; fronds bipinnate (in W. African species), spirally arranged, when young covered with long simple hairs, base with a stipule-like flange; leaf trace crescent-shaped; sporangia with walls one cell thick borne on both surfaces of fertile pinnules in the upper part of the leaves (in W. African species) pyriform with a short stalk made up of about 5 rows of cells; annulus represented by a cluster of lateral cells with thickened walls. Gametophytes normally monoecious, elongate, dark green, fleshy thalli with a projecting midrib on the lower surface. Antheridia on margins or on the lower surface near the margin, projecting, with a 6–10-celled wall and a triangular or oval opercular cell. Archegonium with 8–10-celled neck, straight or slightly curved.

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*OSMUNDA* Linn. — Sim F.S.A. 310 (1915); Copel. Gen. 21 (1947).

Stout scaleless ferns with woody caudex; fronds large, up to 1 — 1.2 m. high; bipinnate, upper pinnae and pinnules without laminae but bearing close clusters of large subspherical sporangia which dehisce by an apical slit.

*Osmunda regalis* Linn. Sp. PL. 2: 1065 (1753); Hook. Syn. Fil. 427 (1868); Sim F.S.A. 310, t. 170 (1915); Tard. in Mém. I.F.A.N. 28: 30 (1953).

Roux 2009: Accepted name

Sea level up to 6,000 ft. alt.; [on rocks in and near streams and lakes.](#)

**Fr.Sud.:** Baninko Chev. 110 (ex Tard.). **Fr.G.:** R. Tenée, Dalaba Abbayes 833 (BM); Fouta Djallon Chev. 12650 (K), Pobéguin 6 (K); Farana Sc. Elliot 5370 (K). **S.L.:** Bintumane T. S. Jones 12 (BM, N J); Loma Mts. Jaeger 487 (N J); Njala Deighton 513 (K, NJ); Colony Dawe 405 (K, NJ); Regent to Bathurst Johnston (BM), 86 (K). **Lib.:** R. Mano, below Jai Bunting (BM). **N.Nig.:** Vom, Jos Plateau Dent Young 270 (K); Guna R., Jos Savory UCI 143 (K). **S.Nig.:** Mt. Koloishe, Obudu Div. Savory & Keay FHI 25118 (BM). **Br.Cam.:** Bafut–Ngemba F.R., Bamenda Tiko FHI 22156 (K). **F.Po:** Moka Exell 812 (BM).

Widespread in N. Temperate zone, also in Africa generally, Mascarene Islands, India and S. America.

## 8. GLEICHENIACEAE

Perennial terrestrial herbs with wide-creeping rhizomes; frond apparently dichotomous, due to arrested growth owing to the formation of a dormant terminal bud; apex of rhizome and buds covered with scales or hairs; stipule-like leaflets present in some species; pinnae lobed almost to the costa, elongate (in W. African species), with forked free veins; sori on the veins punctate with a few large sessile sporangia; no indusium; annulus uniseriate, sharply defined, oblique and complete except at the line of dehiscence; dehiscence vertical; spore trilete (in W. African species). Gametophyte cordate at first, becoming elongate, with thick costa projecting strongly on the ventral surface and sulcate above with uplifted wings with crisped margins; rhizoids stout, abundant, most species with 2-celled hairs; monoecious; antheridia abundant on ventral surface.

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*GLEICHENIA* Sm. — Sim F.S.A. 295 (1915).

*Dicranopteris* Bernh. — Copel. Gen. 28 (1947).

Straggling scrambling ferns with a characteristic forked habit; fronds bright green, pinnate, pinnae divided almost to costa into narrow ribbon-like pinnules; scales none, young parts rufous-hairy; sori dorsal, non-indusiate, with few sporangia.

*Gleichenia linearis* (Burm.) C.B. Clarke in Trans. Linn. Soc. 1: 428 (1880); Sim F.S.A. 299, t. 158 (1915); Ogata Ic. Fil. Jap. 4: 180 (1931).

Roux 2009: Synonym of *Dicranopteris linearis* (Burm.f.) Underw.

*Polypodium lineare* Burm. Fl. Ind. 235 (1768).

*Dicranopteris linearis* (Burm.) Underw. in Bull. Torr. Bot. Club 39: 250 (1907); Tard. in Mém. I.F.A.N. 28: 34, t. 2, fig. 6 (1953).

*Gleichenia dichotoma* (Thunb.) Hook. Sp. Fil. 1: 12 (1844), partly; Syn. Fil. 15 (1865), partly.

Common in secondary growth areas, growing in masses, sometimes scrambling over small trees; up to 4,800 ft. alt.

**Fr.G.:** Nzékoré Schnell 2802; Boula Col Schnell 120; Mt. Nimba Schnell 398; Fouta Djallon Pobéguin 222; Voroa Col Portères; Kakoulima Nicklès 46; Macenta Adam 8035 (all ex Tard.). **S.L.:** Kambul F.R. Lane-Poole 241 (K, NJ); Dambaye Valley, Kenema Small 60 (K, NJ); Njala Deighton 1825 (K, NJ), 4716 (K, NJ); Makali Deighton 4395 (K, NJ). **Lib.:** Grand Bassa Dinklage 2099 (BM); Suacoco, Gbanga Daniel 400 (BM, K); Kitomu, Ganta Harley 53 (K). **Iv.C.:** Téké Forest, N. of Abidjan Abbayes 294 (BM). **Ghana:** Puso Puso Ravine Adams 510 (BM, K); Axim Irvine 2147 (K); Abra, Axim Road Box 2870 (BM); Merishe, Adiembra, Ashanti Kitson 1223 (K); Tarkwa Vigne 4120 (K); Dadwene, Wasa Danguah 17 (BM). **N.Nig.:** Patti Lokoja Dalz. 241 (K); Wana Hepburn 164 (K). **S.Nig.:** Sapoba Richards 3920 (BM, K); Awka Thomas 69 (K); Agulu Keay FHI 21525 (BM); Oban Talbot (BM).

**Br.Cam.:** Bamenda Rosevear (BM). **F.Po:** Kalbreyer 223 (BM, K), Bradley Gregory (BM), T. Vogel 84 (K), Mann 138 (K), Barter (K).

Old World Tropics. (Fig. 4.)

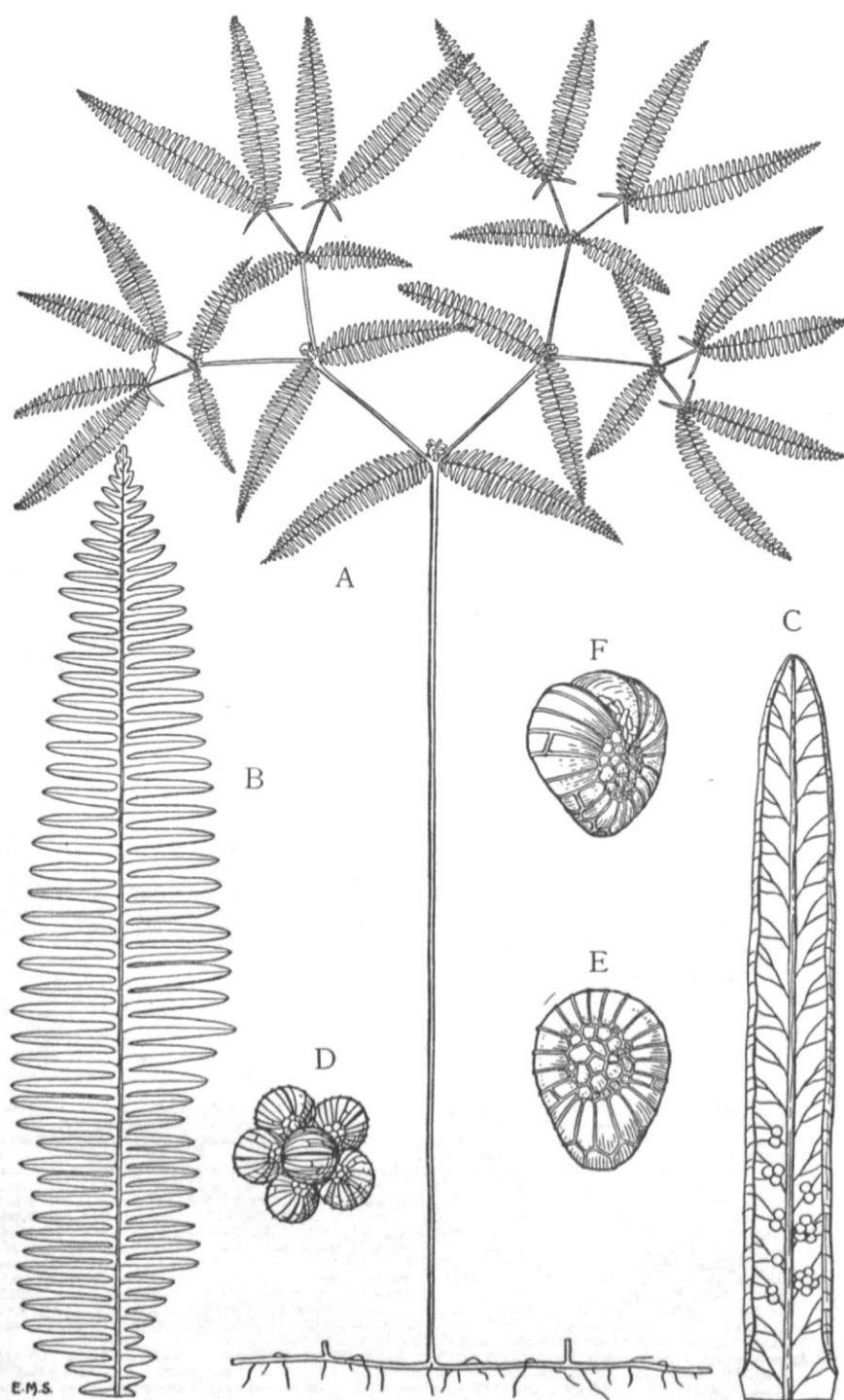


Fig. 4.—*Gleichenia linearis* (Burm.) C. B. Clarke (Gleicheniaceae).

A. habit, x 1/6. B. pinnule, x 1. C. lobe of pinnule, x 5. D. sporangia, x 30. E, sporangium before dehiscence, x c. 80. F, sporangium after dehiscence, x c. 80. Drawn from *Box* 2870.

## 9. SCHIZAEACEAE

Terrestrial ferns with (in W. African species) short creeping hairy rhizomes. Rhachides of indefinite length twining with compound branches (*Lygodium*), or bipinnate fronds of limited growth (*Anemia*). Sporangia solitary, each with a separate false indusium, which is an extension of the leaf margin in *Lygodium* or without indusia in *Anemia*; annulus large, oblong–ovoid with an apical cap, vertically dehiscent. Spores trilete (in W. African species). Gametophytes cordate and thalloid (in W. African species), symmetrical or not, short hairs sometimes present; antheridia on the cushion below the apical notch where they are succeeded by archegonia.

- 1 Fronds erect, bipinnate, with two fertile pinnae at base; indusia absent 1.

*Anemia*

Fronds climbing by twining rhachides; false indusia present ----- 2. *Lygodium*

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### 1. *ANEMIA* Sw. — Sim F.S.A. 306 (1915); Copel. Gen. 24 (1947).

- 1 Fertile pinnae erect, longer than sterile pinnae; fronds up to 60 cm. long 1.

*nigerica*

Fertile pinnae spreading; shorter than sterile pinnae; fronds up to 10 cm. long ----- 2. *sessilis*

#### 1. *Anemia nigerica* Alston in Bol. Soc. Brot., sér. 2A, 30: 6 (1956).

On rocky slopes in scrubby forest.

**S.Nig.:** Idanre Hills Keay FHI 22653 (BM), 22724 (BM), Keay & Onochie FHI 21562 (BM), Richards 3736 (BM, K).

[Differs from *A. schimperiana* Presl by the large size of the stiffly erect fertile pinnae, and from *A. aethiopica* Pic.–Ser. by its larger size, dark red pubescence and densely pubescent (not subglabrous) upper surface of fertile segments.]

#### 2. *Anemia sessilis* (Jeanp.) C. Chr. in Fedde Rep. 11: 371 (1910); Tard. in Bull. Soc. Bot. Fr. 90: 94, fig. 1 (1943); Mém. I.F.A.N. 28: 33, t. 2, fig. 5 (1953).

*Anemia tomentosa* var. *sesilis* Jeanp. (1910). About 2,000 to 3,000 ft.

**Fr.G.:** Falaises de Koussi, Fouta Djallon Pobéguin 15 (BM); Kouria Nicklès 39 (ex Tard.). **Dah.:** Falaise de Natitingou, Mt. Atacora Chev. 24164 (K). **N.Nig.:** Lely 526 (K); Naraguta Lely 307 (K); Mada Hills Hepburn 81 (K).

Also in **Ubangi**.

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### 2. *LYGODIUM* Sw. — Sim F.S.A. 302 (1915); Copel. Gen. 24 (1947).

- 1 Pinnules up to 5 cm. long, ovate, truncate or cordate at base, articulate; spores reticulate; hairs of rhizome black 1. *microphyllum*

Pinnules up to 22.5 cm. long, oblong, truncate or cuneate at base, not articulate; spores not reticulate; hairs of rhizome brown ----- 2. *smithianum*

#### 1. *Lygodium microphyllum* (Cav.) R. Br. Prod. Fl. N. Holl. 162 (1810); Tard. in Mém.

I.F.A.N. 28: 32 (1953).

Roux 2009: Accepted name

*Ugena microphylla* Cav. Ic. Descr. Pl. 76, t. 595, fig. 2 (1801).

*Lygodium scandens* of Hook. Syn. Fil. 437 (1868), partly; Sim F.S.A. 302, t. 161–2 (1915); Ogata Ic. Fil. Jap. 7, t. 324 (1936).

Abundant in marshes; scandent up to 15 ft. or more; below 1,000 ft. alt.

**Sen.:** Cape Verde Thomson (BM). **Gam.:** Ingram (K); near Gungwa Fraser 46 (BM). **Fr.Sud.:** Nguer to Birou Tialam Chev. 2915 (K). **Port. G.:** Canchungo, Pecixe Isl. Esp. Santo 2049 (LISC); Formosa, Acóco. Esp. Santo 1992 (LISC); Bissora Esp. Santo 3210 (LISJC). **Fr.G.:** Heudelot 902 (OXF). **S.L.:** Freetown Dalz. 946 (K); Bagroo R. Mann (K); Yagoi, N. of Bonthe T. S. Jones 38 (BB); Taiama Deighton 4686 (K, NJ); Kambui F.R. Small 103 (NJ). **Lib.:** Ganta Harley 219 (BM, K), 7 (K); Bushrod Isl. Barker 1099 (K); Du R. Linder 72 (K); Bassa T. Vogel 3 (K). **Iv.C.:** Adiopodoumé Abbayes 58 (BM). **Ghana:** Bantama, W. of Kumasi Box 2907 (BM); Axim Johnson 997 (K), Irvine 2144 (K); Essiama Deakin 148 (K); Brawile, Axim Cudjoe 48 (K); Simpa Vigne FH 2912 (K); Anyianam Darko 13 (K).

**Dah.:** Porto Novo Chev. 23341 (ex Tard.); Sakéte Chev. 22813 (ex Tard.); Zagnanado Chev. 23065 (ex Tard.). **N.Nig.:** Nupe Barter (BM). **S.Nig.:** Lagos Barter 2197 (K); Sapoba Richards 3921 (BM, K); Akapaka F.R., Onitsha Jones FHI 1077 (BM); Bonny Kalbreyer 67 (BM), Mann 537 (K); Big Town, Eket, Calabar Onochie FHI 32932 (K).

Old World tropics generally.

2. *Lygodium smithianum* Presl ex Kuhn Fil. Afr. 169 (1868); Prantl Untersuch. Morph. Gefässkrypt. 2: 80 (1881); Engl. Pflanzenw. Afr. 2: 63, fig. 60 (1908); Tard. Mém. I.F.A.N. 28: 33 (1953). L. pinnatifidum of Hook. Syn. Fil. 438 (1868), partly, not of Sw.

Roux 2009: Accepted name

Climbing over shrubs and trees in secondary forest; below 1,000 ft. alt.

**Fr.G.:** Nzérékoré Adam 3788 (ex Tard.); Mt. Ziam Adam 3284 (ex Tard.); Macenta Adam 4769 (ex Tard.). **Lib.:** Tappita Harley 145 (BM); Ganta Harley 6 (K); Peahtah Linder 956 (K). **Iv.C.:** Bingerville Chev. 15607 (ex Tard.); Malamalasso to Daboine Chev. 17553 (ex Tard.); Bouroukrou Chev. 16728 (ex Tard.), 17007 (ex Tard.); Adiopodoumé Abbayes 59 (ex Tard.); Yapo Roberty 12048 (K). **Ghana:** Asuansi Box 2042 (BM), 2047 (BM); Prince's R. Burton & Cameron (K); Axim Chipp 416 (K.); Potroasi, Kibi Adams 162 (K); Tarkwa Vigne FH 4124 (K); Begoro, Akim Irvine 1367 (K).

**S.Nig.:** Nikrowa, Okomu F.R. Richards 3604 (K); Oban Talbot (BM); Old Calabar Robb (BM); Udi Kitson (BM). **Br.Cam.:** Man o' War Bay Schlechter 12399 (BM, K); Mamfe Rosevear (BM); Johann-Albrechtshöhe Staudt 552 (K). **F.Po:** Mann (BM), 136 (K); T. Vogel 66 (K); Barter (K); Kalbreyer 43 (BM, K).

Extends southwards to Angola. (Fig. 5.)

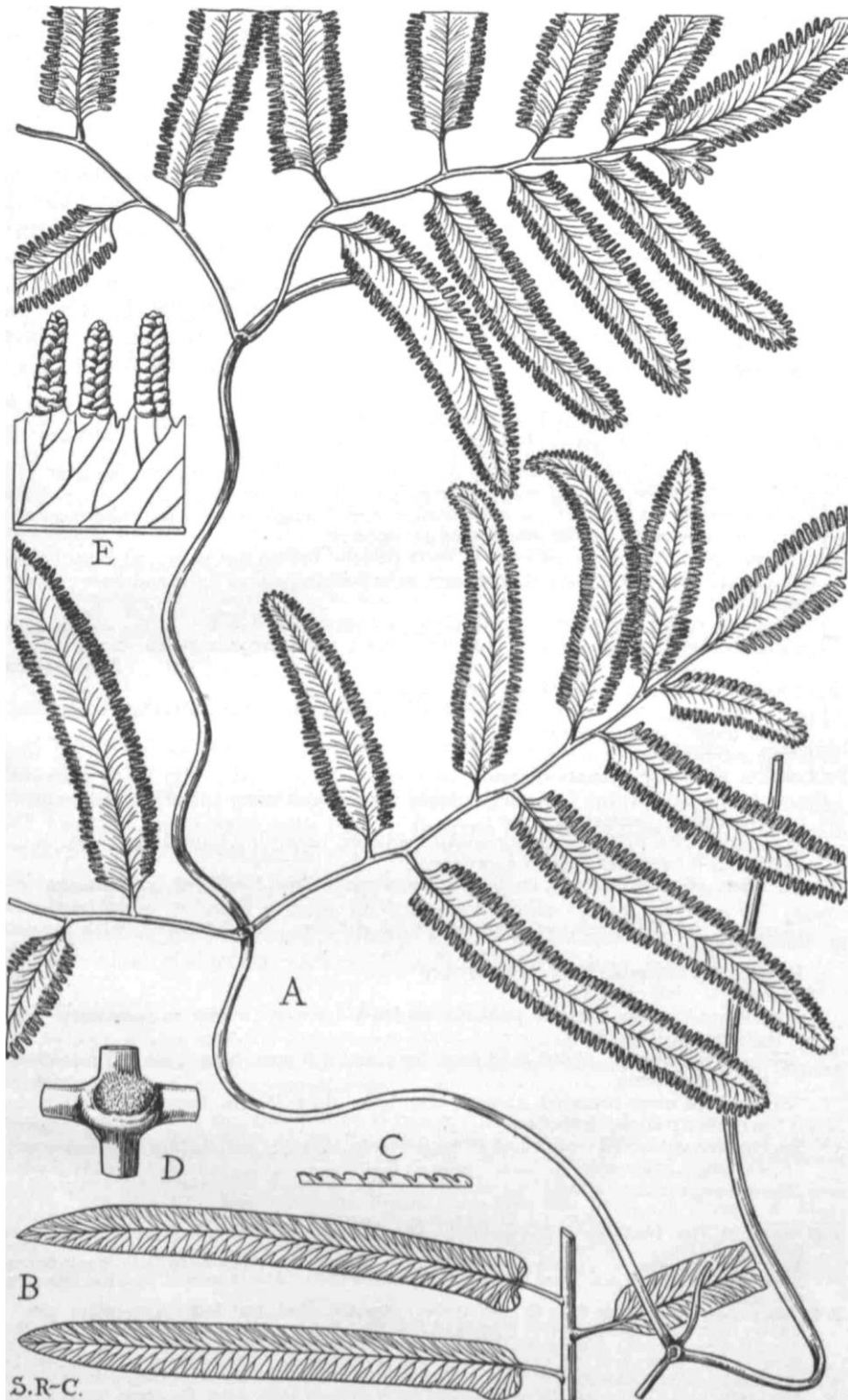


Fig. 5.—*Lygodium smithianum* Presl ex Kuhn (Schizaeaceae).

A, portion of fertile frond, c. 1/2. B, sterile pinnules, c. 1/2. C, margin of sterile pinnule, x 4. D, pulvinus, x 3. E, sori with each sporangium covered by a separate indusium, x 3.



## 10. MARSILEACEAE

Herbs growing in water or wet places, with wide-creeping solenostelic, sometimes hairy rhizomes. Fronds with four fan-shaped leaflets clustered at the apex of the stem (in *Marsilea*); veins forking or anastomosing. Sporangia enclosed in hard bean-shaped sporocarps which arise from the petiole; each sporocarp represents a lateral segment of the leaf; the sporocarp opens in water and extrudes a (at first) ring-shaped then elongate gelatinous body with several pairs of sori, each surrounded by a gelatinous indusium. Heterosporous. Gametophytes dioecious, minute.

**MARSILEA** Linn. — Bak. F. Allies 138 (1887); Sim F.S.A. 313 (1915); Copel. Gen. 230 (1947).

- 1 Sporocarps several, arising separately one above the other well above the base of the petiole, without teeth; pedicels scarcely exceeding sporocarps *1. polycarpa*  
Sporocarps one or more, fasciculate or arising from a single pedicel near the base of the petiole, usually with one or more teeth at apex: ----- 2
- 2 Sporocarps 2 — 4, arising at the base of each petiole, brown not shiny, glabrescent with appressed hairs, not bordered or ribbed, attached to pedicel by broad base; pedicels ascending: 3  
Sporocarps solitary at base of petiole: ----- 4
- 3 Pedicel exceeding sporocarp; teeth distinct; sporocarps 2–4 *2. diffusa*  
Pedicel shorter than sporocarp; teeth minute; sporocarps in pairs ----- *3. senegalensis*
- 4 Sporocarps black and shining, outer shell becoming detached, attached to pedicel by broad base; pedicel recurved: 5  
Sporocarps dark brown not shiny, outer shell persistent; attached to pedicel by narrow base; pedicel straight: 6
- 5 Leaflets broadly obovate–deltoid *4. nubica*  
Leaflets narrowly cuneate–deltoid ----- *5. gymnocarpa*
- 6 Sporocarps with deflexed or horizontal pedicels, becoming buried in the earth: 7  
Sporocarps with erect pedicels: ----- 9
- 7 Pedicel 2–3 times as long as sporocarp: 8  
Pedicel 5–6 times as long as sporocarp ----- *8. gibba*
- 8 Leaflets obovate–deltoid, entire; sporocarps 3 mm., bordered, glabrescent *6. subterranea*  
Leaflets deltoid, crenate; sporocarps 3.5–4.5 mm., not bordered, with persistent tomentum ----- *7. distorta*
- 9 Sporocarps on long slender pedicels, at least 4 times as long as sporocarp, small; leaflets small, entire: 10  
Sporocarps with relatively short stout pedicels, larger; leaflets larger, often crenate: ----- 11
- 10 Sporocarps oblong, about 2.25 mm. long and 1.5 mm. broad, ribbed; leaflets up to 10 mm. long *9. trichopoda*  
Sporocarps more rounded, about 2 mm. long and 1.75 mm. broad, scarcely ribbed; leaflets up to 4.5 mm. long  
----- *10. muscoides*

1. *Marsilea polycarpa* Hook. Grev. Ic. Fil. t.160 (1829); Bak. F. Allies 139 (1887).

Roux 2009: Synonym of *Marsilea minuta* L. var. *minuta*

*Marsilea berthauti* Tard. In Notulae Syst. 15: 85 (1965); Berhaut Fl. Sén. 17: 23, t. 3, fig. 4 (1954).

**Sen.:** Tambacounda, R. Gambia Berhaut 901 (P). **Ghana:** Brup, Lawra (fr. Oct.) Hinds 5007 (K); Burufo Adams (P). **N.Nig.:** near Kaduna A. M. Jordan (BM).

Also in tropical America, Malay Peninsula and Tahiti.

2. *Marsilea diffusa* Lepr. ex A. Br. in Flora 22: 300 (1839); Monatsb. Akad. Berl. 1863: 419 (1864); 1870: 726 (1871); Bak. F. Allies 141 (1887); Trabut in Rev. Gen. Bot. 6: 211, t. 4 (1894); Glück Biol. Morph. Wass. U. Sumpfgew. 3: 540, fig. 98 (1911); C. Chr. in Dansk. Bot. Ark. 7: 179, t. 73, fig. 13–14 (1932); Maire Fl. Afr. Nord 1: 83, fig. 46 (1952).

Roux 2009: Synonym of *Marsilea minuta* L. var. *minuta*

*Marsilea diffusa* var. *incurva* A. Br. in Monatsb. Akad. Berl. 1863: 419 (1864).

*Marsilea crenulata* var. *incurva* (A. Br.) A. Br. ex Kuhn Fil. Afr. 198 (1868); Monatsb. Akad. Berl. 1870: 728 (1871).

*Marsilea diffusa* var. *algeriensis* Bak. & Trab. Atlas Fl. Alger. 32, t. 23 (1895).

*Marsilea crenulata* of A. Br., partly.

On dried mud of seasonal ponds and rice swamps.

**Gam.:** Dawe 26 (K). **Sen.:** Leprieur (P), Perrottet 993 (P), 1001 (ex A. Br.); Kap Leprieur 992 (P); Richard Tol Lelièvre (B); Dagana Leprieur 182 (P). **Fr.Sud.:** Bafaga Chev. 707 (ex Tard.); Kita Chev. 108 bis (K), 109 (K, P). **Port. G.:** Bafata, Dandum Esp. Santo 2680 (LISC); Farim, Begene Esp. Santo 2389 (LISC). **Ghana:** Accra — Ada Road Adams 175 (BM); Yendi–Tamale Road Adams & Akpabla GC 4139 (BM); Burufo, Lawra Adams & Akpabla GC 4378 (BM); Walewale–Gambaga Road Adams & Akpabla GC 4202 (BM). **N.Nig.:** Sokoto Dalz. 522 (K, sterile); Kagara, Niger Prov. Meikle 1387 (BM, K); Daura Road, 34 miles from Katsina Meikle 1221 (BM, K).

Also in the Canaries, Algeria, the Sudan, Angola (?), Tanganyika (Greenway 3591, 5105) and Madagascar.

[Heudelot 576, from Walo near St. Louis, Senegal as represented at Kew and R. Casamance at Paris, has rather long, slender pedicels and may represent a distinct species.]

3. *Marsilea senegalensis* A. Br. ex Bak. F. Allies 141 (1887).

Roux 2009: Synonym of *Marsilea minuta* L. var. *incurva* (A.Braun) Launert

**Sen.:** Perrottet (B); Niokolo–Koba Berhaut 4526 (P). **Fr.G.:** Kouroussa Pobéguin 955 (P); Kadi Pobéguin 1988 (P). **Ghana:** Dawa Adams 436 (BM); Dodowa Road, Accra Scholes 135 (BM).

4. *Marsilea nubica* A. Br. in Monatsb. Akad. Berl. 1863: 432 (1864); Bak. F. Allies 142 (1887); Berhaut Fl. Sen. 17: 23, t. 3, fig. 8 (1954).

Roux 2009: Accepted name

**Maur:** Lelfalar Chudeau (P). **Sen.:** Berhaut 1410 (ex Berh.).

Also in Shari, the Sudan and S.W. Africa (Barnard, Schweickerdt.).

5. *Marsilea gymnocarpa* Lepr. ex A. Br. in Monatsb. Akad. Berl. 1863: 432 (1864); 1870: 751 (1871); Bak. F. Allies 145 (1887); Hagerup in K. Danske Vid. Selsk. Biol. Medd. 9: 4 (1930); Berhaut Fl. Sen. 17: 24, t. 3, fig. 5 (1954).

Roux 2009: Synonym of *Marsilea nubica* A. Braun var. *gymnocarpa* (Lepr. ex A. Braun) Launert

? *M. pygmaea* Brongn. in Bory Dict. Class. Hist. Nat. 10: 199 (1826).

Damp hollows in sand and saline flats on the banks of rivers after flood.

**Sen.:** right bank of R. Sénégal, near Richard Tol, Walo Leprieur (P), Perrottet 80 (B), 995 (P). **Fr.Sud.:** Notárret, Kutso, Timbuktu Hagerup (BM); Gao (fr. Mar.) De Wailly 4986 (P).

6. *Marsilea subterranea* Lepr. ex A. Br. in Flora 22: 301 (1839); in Monatsb. Akad. Berl. 63: 433 (1864); 1870: 724 (1871); Bak. F. Allies 145 (1887); Berhaut Fl. Sen. 17, 23, t. 3, fig. 6 (1954).

Roux 2009: Accepted name

**Sen.:** Perrottet 996 (BM, K), Leprieur (ex A. Br.), Depreaux (ex A. Br.).

7. *Marsilea distorta* A. Br. in Monatsb. Akad. Berl. 1863: 433 (1864); 1870: 750 (1871); Bak. F. Allies 147 (1887).

Roux 2009: Accepted name

In recently flooded areas when the water has subsided.

**Sen.:** Perrottet (P); Dagana, Walo Leprieur (B, P); Richard Tol Lelièvre (P). **Fr.Sud.:** between Haute Sénégal and R. Niger Bellamy 169 (P).

8. *Marsilea gibba* A. Br. in Monatsb. Akad. Berl. 1870: 745 (1871); Bak. F. Allies 145 (1887).

Roux 2009: Accepted name

**Fr.Sud.:** Bagoundie, near Gao (fr. Sept.) De Wailly 4811 (P).

9. *Marsilea trichopoda* Lepr. ex A. Br. in Monatsb. Akad. Berl. 1863: 422 (1864); 1870:

749 (1871); Bak. F. Allies 147 (1887); Engl. Pflanzenw. Afr. 2: 66, fig. 63 (1908); Berhaut Fl. Sen. 17: 23, t. 3, fig. 7 (1954).

Roux 2009: Synonym of *Marsilea coromandelina* Willd.

Wet sandy ground.

**Sen.:** Perrottet (A. Br.); sands of Laybar Leprieur (P); Dakar (fr. Jan.) Chev. 2927 (P), Thièbaut 156 (P), 554 (P). **Gam.:** Cape St. Mary Heudelot 548 (K, P).

Also in Mauritania (Boniface 241) Eritrea and Tanganyika Territory (Hoarer 1467).

10. *Marsilea muscoides* Lepr. ex A. Br. in Monatsb. Akad. Berl. 1863: 422 (1864); 1870: 749 (1871); Bak. F. Allies 147 (1887); Engl. Pflanzenw. Afr. p. 66, f. 64 (1908).

Roux 2009: Synonym of *Marsilea coromandelina* Willd.

? *M. pygmaea* Brongn. (see also species No. 5).

Wet sandy ground under palms.

**Sen.:** Perrottet (P); Cap Naze Leprieur (A. Br.); Makouloural, Cayor Leprieur (P).

Also In Angola.

11. *Marsilea fimbriata* Schum. in K. Danske Vidensk. Selsk. 4: 235 (1829); A. Br. in Monatsb. Akad. Berl. 1863: 432 (1864); Bak. F. Allies 142 (1887).

Roux 2009: Synonym of *Marsilea minuta* L. var. *minuta*

**Ghana:** Akwapim, or Whydah (Dahomey), Thonning (ex Schum.).

An imperfectly known species but likely to be the same as *M. senegalensis* A. Br. ex Bak.

## 11. SALVINIACEAE

Small floating herbaceous plants. Rhizome horizontal, branched, siphonostelic, without roots. Leaves in whorls of three of which two are entire and floating, and the third submerged and finely dissected into root-like segments, which are thickly covered with hairs; floating leaves papillose. Sori borne in sporocarps on the submerged leaves; sporocarp-wall hairy, delicate, 2 cell-layers thick; sporocarp representing an indusium with a columnar receptacle at the base. Sporangia in small groups on branched stalks springing from the receptacle; heterosporous; mature sporocarps sink to the bottom and decay, releasing the spores which rise to the surface. Gametophytes floating, minute.

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*SALVINIA* Adans. — Bak. F. Allies 134 (1887); Copel. Gen. 232 (1947).

Small aquatic plants without roots, with horizontal hairy steins and floating entire leaves; sori on submerged root-like leaves in globose sporocarps of two kinds, bearing mega- and microsporangia respectively.

*Salvinia nymhellula* Desv. in Ann. Soc. Linn. Par. 6: 177 (1827); Herzog in Hedwigia 74: 276, fig. 6–7 (1935).

Roux 2009: Accepted name

*Salvinia nigropunctata* A. Br. in Kuhn Fil. Afr. 201 (1868); Bak. F. Allies 185 (1887).

*Salvinia natans* of A. Chev. Bot. 777 (1920); Savory in Nigeria 34: 218, fig. (1950); not of (Linn.) All.

Floating on the surface of lagoons, swamps, rivers and ponds; usually near sea level; often occurring in large colonies.

**Ghana:** pond near Kpotame on E. side of road, Tefle Adams 442 (BM, K, P); Tefle Road, 2 miles from Vume Foote 1003 (BM). **Dah.:** Avrankou Lagoon, Porto Novo Chev. 22765 (P). **Fr.Nig.:** R. Niger, Jassane, Niamy De Wailly 539P (P). **N.Nig.:** Nupe Barter 1433 (K). **S.Nig.:** Eluju, Omo (formerly part of Shasha) F.R. Richards 3216 (BM); Ogun R., Isheri Trewawa (BM); Eyinarosa, Epe Keay FHI 16056 (BM); R. Niger Barter 303 (K); Okomu F.R. Richards 3655 (BM); Warri Beauvois (Herzog); mouth of Old Calabar R. Mann (K).

Also French Cameroons (Zenker), Gabon and French Congo (Lecomte). (Fig. 6.)

## 12. AZOLLACEAE

Small floating moss-like plants with fragile pinnately branched, apparently siphonostelic rhizomes, covered with small imbricate leaves. Roots numerous with numerous root hairs (in W. African species). Leaves in two rows, each leaf consisting of an upper, floating, photosynthetic lobe which rests obliquely on the water touching it only on one edge and a lower submerged hyaline lobe with cavities in its lower surface, usually inhabited by blue green alga (*Anabaena*). Sporocarps borne on the first leaf of a lateral branch on a submerged lobe; sporocarps containing megasporangia ellipsoid, those with microsporangia, larger, nearly as long as the upper leaf lobe; walls of sporocarps delicate, 2-layered except at tip. Microsporangia on simple stalks rising from a columnar receptacle; a vestigial uniseriate annulus may be present. Megasporangia solitary at the base of the sporocarp. Microspores of each microsporangium liberated in masses, which are called massulae and bear small bristle-like appendages. Megaspores germinate at the surface of the water and produce a minute prothallus with 1 or more archegonia.

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*AZOLLA* Lam. — Bak. F. Allies 137 (1887); Sim F.S.A. 312 (1915); Copel. Gen. 232 (1947).

Small aquatic ferns with horizontal branching stems and minute imbricate floating leaves in 2 rows; roots and root-hairs present; sori on submerged lower lobes of leaves in sporocarps of 2 kinds bearing mega- and microsporangia respectively.

*Azolla africana* Desv. in Ann. Soc. Linn. Par. 6: 187 (1827); Nakai in Bot. Mag. Tokyo 39: 184 (1925).

Roux 2009: Synonym of *Azolla pinnata* R.Br. subsp. *africana* (Desv.) R.M.K.Saunders & K.Fowler

*Azolla guineensis* Schum. in K. Danske Vidensk. Selsk. 4: 236 (1829).

*Azolla pinnata* var. *africana* (Desv.) Bak. F. Allies 138 (1887), partly; Chev. Bot. 778 (1920).

*Azolla* sp. — Savory in Nigeria 34: 217 & fig. (1950).

*Azolla pinnata* of Kew Bull. 1891: 275, not of A. Br.; Sim F.S.A. 312, t. 172, fig. 1 (1915); Chev. Bot. 777 (1920).

Floating on the surface of ponds or backwaters of rivers, with floating grass and *Lemna*; sea level to 1,000 ft.

**Sen.:** Néma Berhaut 169 (P). **Gam.:** Brown-Lester (P). **Fr.Sud.:** Fo Chev. 957 (P); Fafa, Gao De Wailly 5351 (P); Sendegue Monod (IFAN). **S.L.:** Gbundapi Adames 69 (K, NJ); Gbap Adames 27 (K, NJ); Messima, Messi Krim Adames 42 (K, NJ); Tapetuk Adames 142 (K, NJ). **Iv.C.:** near Dabou Giovannetti (IFAN) Abbayes 2251 (BM), 2252 (BM). **Ghana:** Achiasi, S. of Oda Box 2920 (BM). **Togo:** Rohbkové, Mahoux 413 (P). **Dah.:** Lavi Newton 2 (K); Avrankou Lagoon, Porto Novo Chev. 22767 (ex Chev.). **S.Nig.:** Ogun R., at Isheri Trewawa (BM); Yoruba country Millson (K); R. Niger T.

Vogel (BM, K), Barter 299 (K); Okomu F.R., E. W. Jones 3713 (BM). **Br.Cam.** Aboland Keller 12342 (P); Meme R., between Love and Kumbe Dusen (P).  
Widespread in tropical Africa. (Fig. 7).

### 13. CYATHEACEAE

Tree ferns, with (in W. African species) stout erect dictyostelic trunks. Stems clothed with persistent leaf-bases and matted adventitious roots; scales present at the apex of the stem and bases of the stipe; fronds large, bipinnate, usually spiny at base, arranged spirally at the apex of the stem. Veins simple or pinnate, never anastomosing in W. African species. Leaf-trace with many bundles. Sori superficial, dorsal in the veins with sporangia developing in basi-petal succession. Indusium, if present, surrounding the sorus and usually cup-shaped. Sporangia thin-walled, attached to a small raised receptacle, typically on short 4-celled stalks. Annulus oblique, complete, dehiscence horizontal. Gametophytes cordate, thalloid, longer and more massive than in *Polypodiaceae*; the plate is formed earlier than in *Polypodiaceae* and no filament is left at the base of the thallus; multicellular hairs sometimes present, green; antheridia usually on ventral surface, with a stalk cell; lower ring cell attached lengthwise; primary cap cell usually once divided.

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*CYATHEA* Sm. — Sim F.S.A. 82 (1915); Copel. Gen. 95 (1947).

**1** Fronds bipinnatifid or rarely somewhat bipinnate; stems slender; stipe somewhat muricate at base; fronds about 2 m. long *1. camerooniana*

Fronds tripinnatifid or tripinnate: ----- **2**

**2** Stems slender, 6 cm. in diam.; stipes very spiny at base, muriculate in the upper part; fronds about 2.5 m. long; young fronds with short matted brown tomentum developing in succession; costae hairy above *2. manniana*

Stems stout, about 22.5 cm. diam.; stipes muriculate at the base only, smooth in upper part; fronds about 1.5 m.

long, young fronds green with shaggy brown hairs, glabrescent, developing in whorls; costae glabrous above *3. dregei*

*1. Cyathea camerooniana* Hook. Syn. Fil. 21 (1865).

Roux 2009: Synonym of *Alsophila camerooniana* (Hook.) R.M.Tryon var. *camerooniana*

*Alsophila camerunensis* Diels in E. & P. Pflanzenfam. 1, 4: 935 (1899).

*Cyathea aethiopica* of Tard. in Mém. I.F.A.N. 28: 50, t. 6, fig. 1, 2 (1953).

In heavily shaded gullies near streams and swamps; up to 5,000 ft. alt.

**Fr.G.:** source of R. Niger Jaeger 135 (BM, NJ). **S.L.:** Bintumane T. S. Jones 1316 (BM, NJ); Sherbeh Banjura (NJ); Upper Neaboi valley, Kambui Hills Small 889 (BM). **Lib.:** Gola Forest Bunting (BM); Kitomu Harley F. 165 (BM); Mt. Bill Barker 1159 (K); Bilimu Harley 85 (K); West of Bilipia Harley 54 (K). **Iv.C.:** Mt. Tonkouli Abbayes 538 (P). **Ghana:** R. Awa, Awaso Darko 31 (BM); Tano-Ofin F.R. Vigne FH 2876 (K); Puso Puso Ravine, Kibi Mts. Scholes 438 (BM), Box 3272 (BM), 3273 (BM), Adams 324 (BM), Usher 7 (BM); Baskeh, Axim Cudjoe 20 (K); Tarkwa-Dompa-Simpa Road Fishlock 1 (K); Prestea Vigne FH 3088 (K). **S.Nig.:** R. Ata, below Mt. Koloishe, Obudu Div. Savory & Keay FHI



25043 (BM); Ikvette, Obudu Div. Savory & Keay FHI 25263 (BM). **Br.Cam.:** Cam. Mt. Mann 2059 (K); Brenan 4382 (BM, K); S. Bakundu F.R. Richards 4044 (BM, K), 4054 (BM, K). **F.Po:** Moka, Concepcion Guinea 2092 (BM).

2. *Cyathea manniana* Hook. Syn. Fil. 21 (1865); Tard. in Mém. I.F.A.N. 28: 52, t. 6, fig. 3–5 (1953).

Roux 2009: Synonym of *Alsophila manniana* (Hook.) R.M.Tryon

Montane forest and forested ravines, by stream sides; about 400 to 6,500 ft. alt.

**Fr.G.:** Dalaba Caille 18 (K); Nimba Mts. Portères (P); Macenta Portères 2600 (P). **S.L.:** Heremafondu Plateau, Sankan Biriwa Roach (BM); Loma Mts. Jaeger 372 (BM), 785 (BM). **Lib.:** Bilimu Harley 55 (BM, K). **Iv.C.:** Gbanleu to Zelekouma Portères 661 (P). **Ghana:** Puso Puso Ravine, Kibi Mts. Box 3272 (BM), Scholes 437 (BM, K), Usher 9 (BM); Begoro Box 3472 (BM). **S.Nig.:** R. Ata, below Mt. Koloishe, Obudu Div. Savory & Keay FHI 25045 (BM); N.E. side of Mt. Koloishe Savory & Keay FHI 25117 (BM). **Br.Cam.:** above Bamenda Savory (BM), Migeod 420 (BM); Johann–Albrechtshöhe Staudt 867 (BM); Buea Migeod 13 (BM, K), Box 3603 (BM); below Liwonge, Mann’s Spring Richards 4251 (BM); Mopanya Kalbreyer 190 (BM); Babessi Migeod 284 (BM). **F.Po:** Mann (BM), 363 (K), 1392 (K); Musola Guinea 1008 (BM); near L. Moka Adams 1121 (BM, K); Moka Exell 843 (BM); Ilache waterfall Adams 1081 (BM).

Extends southwards to Angola and in eastern Africa from Uganda (Taylor 2764) to S. Rhodesia (Gilliland 1750). (Fig. 8.)

[The var. *preussii* (Diels) Tard. was described from a specimen collected by Preuss in the “Bassaram Mts., S.E. of N’Yansosso, in a small ravine on the first of the forested foot hills from N’Yansosso.” It seems to differ only by being more glaucous beneath.]

3. *Cyathea dregei* Kunze in Linnaea 10: 551 (1836); Hook. Spec. Fil. 1: 23, t. 10, 17 (1846); Syn. Fil. 21 (1865); Sim F.S.A. 82, t. 6 (1915); Marloth Fl. S. Afr. I, t. 10 (1913); Tard. in Mém. I.F.A.N. 28: 52, t. 6, fig. 68 (1953).

Roux 2009: Synonym of *Alsophila dregei* (Kunze) R.M.Tryon

On grassy plateaux or open woodland; 2,500–7,400 ft. alt.

**Fr.G.:** Nimba Mts. Schnell 3713 (P); Fouta Djallon Pobéguin 41 (P). **S.L.:** Bintumane Peak Glanville 387 (K, NJ), T.S. Jones 22 (BM). **N.Nig.:** Jos Plateau Hepburn (K). **S.Nig.:** Obudu Div.: Ikvette Savory & Keay FHI 25226 (BM), 25227 (BM); banks of R. Uete, Old Ikvette Savory & Keay FHI 25167 (BM); Mt. Koloishe Savory & Keay FHI 25064 (BM), 25136 (BM). **Br.Cam.:** above Bamenda Keay FHI 28396 (BM), Migeod 357 (BM, K), 362 (BM, K), Savory UCI 285 (BM), Maitland 1430 (K); Lakom, Bamenda Maitland 1716 (K); Mamfe–Bamenda Road Adams 1586 (BM).

Also in E. and S. Africa from Uganda to Natal.

*Hemitelia ? velaminosa* Diels in E. & P. Pflanzenfam. 1, 4: 132 (1899).

The type could not be found at Berlin in 1952 and the cover was labelled = *Diplazium* sp.

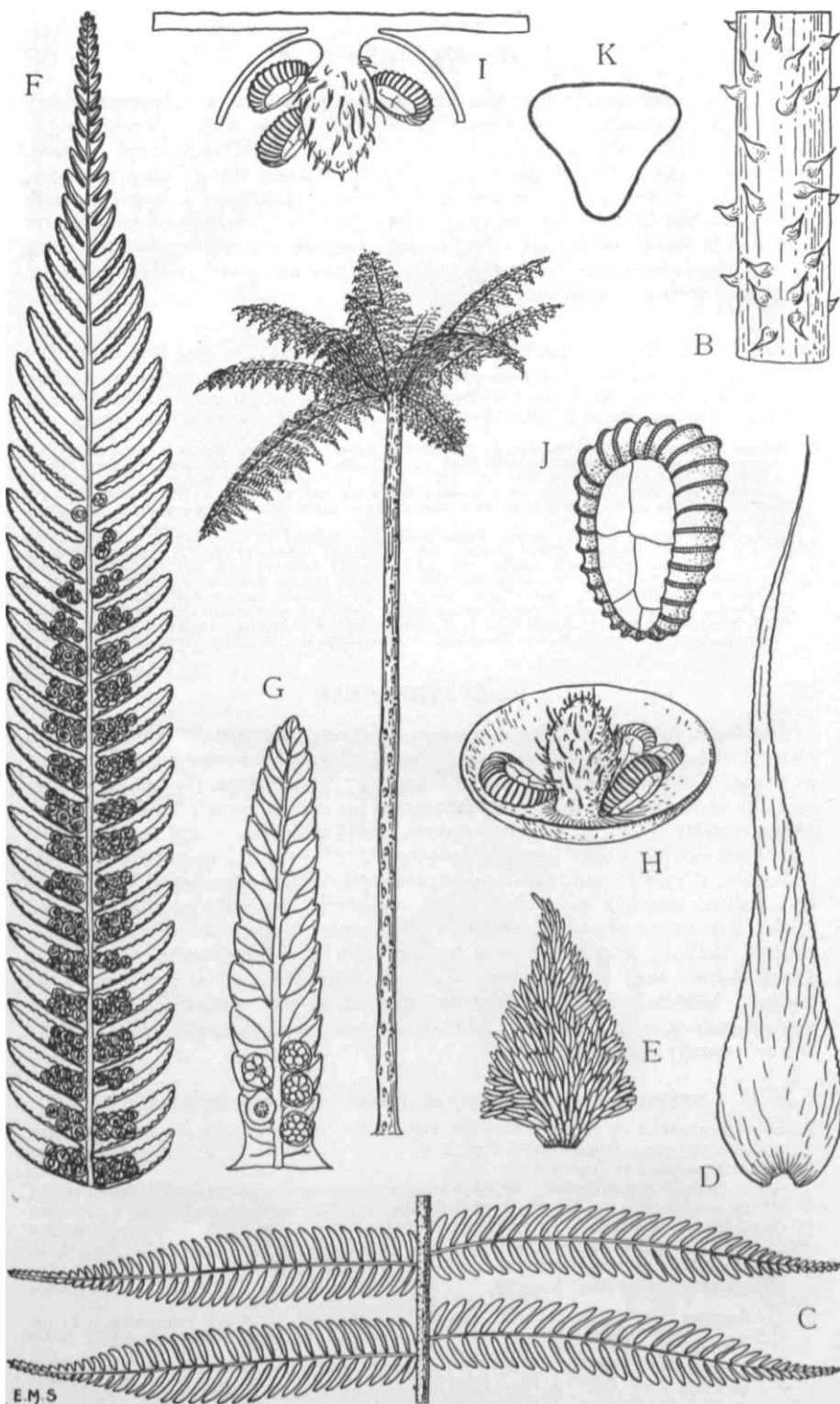


Fig. 8.—*Cyathea manniana* Hook. (Cyatheaceae).

A, habit, from photograph, greatly reduced. B, base of stipe, x 1. C, portion of pinna, x 1. D, scale from base of stipe, x 6. E, scale from underside of costa, x 30. F, pinnule, x 2. G, lobes of pinnule, x 6. H, sorus showing indusium, X 60. I, section of sorus, X 60. J, sporangium, x 200. K, spore (diagrammatic), x 500. B & F-K are drawn from *Mann*; C-E from *Exell* 843.

## 14. HYMENOPHYLLACEAE

Delicate herbs with short, erect or slender wide-creeping protostelic rhizomes, with hairs on young parts. Roots often wanting and replaced by root hairs arising direct from the rhizome or lamina. Fronds compound or simple, with free veins (false veins consisting of rows of thickened cells, which are not connected with the vascular system, are sometimes present); leaves usually one cell thick and without stomata. Sporangia borne in basipetal succession in marginal sori on more or less elongated receptacles, surrounded by a cup-shaped, tubular or 2-lipped indusium, sessile or subsessile. Annulus oblique, complete. Spores trilete. Prothalli monoecious, rarely dioecious, filamentous or narrow and thalloid with pitted cell-walls; gemmae often present; rhizoids often branched; sex organs usually on specialized branches or lobes; antheridia with one-celled stalk, no funnel-shaped basal cell and no definite cap-cell; archegonia with straight necks.

- 1      Receptacle usually considerably elongated and protruding beyond the indusium; indusium not 2-lipped (in W. African species)      *1. Trichomanes*

Receptacle normally shorter than the lips of the indusium; indusium 2-lipped ----- *2. Hymenophyllum*

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### 1. *TRICHOMANES* Linn. — Hook. Syn. Fil. 71 (1866); Sim F.S.A. 67 (1915).

- 1      Rhizome filiform, creeping; less than 0.5 mm. diam.:      2  
Rhizome stout, 1.5 mm. or more in diam., creeping or erect: ----- 13
- 2      Fronds simple or lobes less than half-way to the costa (§ Hemiphlebiium): 3  
Fronds lobed more than half-way to the costa, or pinnate: ----- 7
- 3      Margin bearing distant, black, simple hairs; false nerves wanting      *1. liberiense*  
Margin glabrous; false nerves present: ----- 4
- 4      Cells more or less hexagonal, about 1 1/2 times as long as broad:      5  
Cells narrowly oblong, more than twice as long as broad; marginal false vein interrupted or wanting      *5. aerugineum*
- 5      Fronds without a marginal false nerve; false nerves ending free within the margin  
            *2. ballardianum*  
Fronds with a marginal false nerve; false nerves united with the marginal nerve: ----- 6
- 6      Fronds regularly lobed; margin crisped      *3. chamaedrys*  
Fronds entire or irregularly lobed; margin flat; living fronds dark green ----- *4. erosum*
- 7      Axes of fronds sometimes proliferous; false veinlets wanting; fronds as long as broad, flabellately lobed; with longitudinal folds, stipe not winged; cells about 30μ across, twice as long as broad (§ Gonocormus)      *6. mannii*  
Axes of fronds never proliferous: ----- 8
- 8      False veinlets present (§ Taschneria)      *7. clarenceanum*  
False veinlets wanting (§ Pixidifera): ----- 9
- 9      Fronds about as long as broad, flabellately lobed, with lobes diverging at an angle of about 45 degrees; cells about as long as broad:      10

- Fronds twice as long as broad, pinnately lobed: ----- 11
- 10 Fronds dark green with longitudinal folds apparent on the dried state; cells about 45µ diam., thin-walled 8. *chevalieri*  
Fronds light green plane when dried, without folds; cells about 70µ diam., thick-walled ----- 9. *mettenii*
- 11 Indusium cylindrical, twice as long as broad 10. *borbonicum*  
Indusium turbinate, about as long as broad; cells hexagonal: ----- 12
- 12 Wing of main rhachis about 3 mm. across, reaching almost to the base of the stipe; fronds plane 11. *fallax*  
Wing of main rhachis up to 2 mm. across ----- 12. *africanum*
- 13 Fronds simply pinnatifid or pinnate; rhizome short-creeping; rhachis and veins hispid (§ Achomanes) 13. *crispiforme*  
Fronds 2-4-pinnatifid; fronds glabrous: ----- 14
- 14 Rhizome wide-creeping; stipe widely separated; species epiphytic; rhachis winged; wing of stipes evanescent (§ Scandentia) 14. *giganteum*  
Rhizome erect; stipes tufted; species usually terrestrial; cell walls wavy (§ Rigida): ----- 15
- 15 Upper part of stipes and rhachis winged; fronds 2-3-pinnatifid 15. *guineense*  
Stipes not winged; rhachis winged in upper part only; fronds bipinnate or tri-pinnatifid ----- 16. *cupressoides*

1. *Trichomanes liberiense* Copel. in Phil. Journ. Sci. 51: 160, t. 9, fig. 3-6 (1933); Taton in Bull. Soc. Roy. Bot. Belg. 78: 25, t. 2, fig. g-i (1946); Tard. In Mém. I.F.A.N. 28: 41, t. 4, fig. 1, 2 (1953).

Roux 2009: Synonym of *Didymoglossum liberiense* (Copel.) Copel.

*Trichomanes motleyi* of Engl. Pflanzenw. Afr. 2: 2 & fig. (1908), not of V.d. B.

*Didymoglossum liberiense* (Copel.) Copel. in Phil. Journ. Sci. 76: 78 (1938).

On trunks of forest trees in dense shade; up to 1,300 ft.

**Lib.:** Mt. Coffee Cook (ex Copel.); Wanau Road Harley F. 139 (BM, K); Beidin Harley F. 204 (BM); Bushrod Isl. Baldwin 13070 (BM). **IV.C.:** Banco Forest, Abidjan Abbayes 2009 (BM). **Ghana:** Puso Puso Ravine Adams 1193 (BM). **S.Nig.:** Mile 31, Calabar-Mamfe Road Baldwin 13775 (BM); British Obokum Jones FHI 14119 (K). **Br.Cam.:** Isobi Estate, Debundscha to Bibundi Thorold 21 (BM, K); Bakangili Thorold CP 21 (BM, K).

Also in French Cameroons (Zenker 1994) and Belgian Congo.

2. *Trichomanes ballardianum* Alston in Bol. Soc. Brot. sér. 2A, 30: 26 (1956).

Roux 2009: Synonym of *Didymoglossum ballardianum* (Alston) J.P.Roux

*Trichomanes aerugineum* of Taton l.c. 26, t. 2, fig. E-F (1946), not of V.d. B; Tard. l.c. 43, t. 4, f. 6 (1953).

On tree trunks and rocks.

**S.Nig.:** Shasha F.R. Jones & Onochie FHI 16750 (BM), Richards 3438 (BM, K); Okomu F.R. Richards 3603 (K), 3648 (K); Afi River F.R. Jones & Onochie FHI 18722 (BM); Mfum ferry, Cross B. Keay FHI 28316 (BM).

Also in French Cameroons (Armet 296) and Belgian Congo.

3. *Trichomanes chamaedrys* Taton l.c. t. 2, fig. K–L (1946). ? *T. palmicola* V.d. B. ex Goddijn in Med. Rijks Herb. 17: 32, fig. 19 (1913).

Roux 2009: Synonym of *Didymoglossum chamaedrys* (Taton) J.P.Roux

*Trichomanes erosum* var. *chamaedrys* (Taton) Tard. l.c. 42, t. 4, fig. 5 (1953).

On rocks in shaded places, up to 1,700 ft. alt.

**S.L.:** Kenema, Kambui Hills F.R. Small 820 (BM, N J). **Lib.:** Harley F. 213 (BM); Bushrod Isl. Baldwin 13070 (BM), 13343 (K); Bilimu Harley 195 (BM), 213 (BM), 1988 (K); Gola Forest Bunting (BM) Bobei Mt., Sanokwele Baldwin 9585 (K). **Iv.C.:** Teké Forest Manganot (P). **Ghana:** near Akrum waterfall, Begoro Box 2948 (BM); Afao Hills F.R. Awaso Adams 2066 (BM). **Br.Cam.:** below Liwonge, Mann's Spring Richards 4317 (K). **F.Po:** Barter (K).

Extends southwards to Belgian Congo.

4. *Trichomanes erosum* Willd. Sp. Pl. 5: 501 (1810); Engl. Pflanzenw. Afr. 2: 2, fig. 1 D (1908); Goddijn l.c. 33, fig. 20 (1913); Taton l.c. 28, t. 2, fig. A–B (1946); Tard. l.c. 41, t. 4, fig. 3, 4 (1953).

Roux 2009: Synonym of *Didymoglossum erosum* (Willd.) J.P.Roux

*Trichomanes muscoides* of Hook. Syn. Fil. 75 (1866), partly, not of Sw.

*Trichomanes cuspidatum* of Engl. l.c. 2, fig. 1 A (1908).

On rocks and trees in forest including secondary and fringing forest; 250 to 3,000 ft. alt.

**S.L.:** Picket Hill, 2,600 ft. T. S. Jones 330 (BM); Sini–Koro Forest, Loma Mts. Jaeger 2050 (K); Nicol Brook, Freetown Johnston 44 (K). **Lib.:** Bilimu Harley 195 (BM, K), 1997 (K), 105a (K), 106 (K). **Iv.C.:** Mt. Orombo–Boka Abbayes 449 (BM). **Ghana:** Puso Paso Ravine, Kibi Mts. Box 3266 (BM), Adam s 419 (K); Bunso Scholes (BM); Kakum F.R. Box 2933 (BM), 2856 (BM); Asuansi Box 2081 (BM), 2094 (BM), 2480 (BM); Ancobra B. Johnson 986 (K). **S.Nig.:** Warri Beauvois (BM); Okomu F.R. Nikrowa Ross 111 (BM), Richards 3603, 3648 (BM), E. W. Jones 3638 (BM); Omo (formerly part of Shasha) F.R. Richards 3260 (BM), 3266 (BM), Ross 35 (BM), Jones & Onochie FHI 17240 (BM), Keay FHI 16086 (BM); Kwa Falls, Calabar Richards 4004 (BM, K); Onitsha Barter 1449 (K); B. Nun Barter 20123 (K), Mann 540 (K); Brass Barter 71 (K). **Br.Cam.:** Victoria Kalbreyer 39 (BM); Isobi Estate, Debundscha Thorold CP 5 (BM); Bopo, S. Bakundu F.R. Richards 4042 (BM, K). **F.Po:** Mann (K), Barter (K).

Also in Principe, S. Tomé, Annobon, eastwards to Tanganyika and southwards to Angola and S. Rhodesia (Fisher & Schweickerdt 322).

5. *Trichomanes aerugineum* V.d.B. in Ned. Kr. Arch. 5, 3: 201 (1863); Goddijn l.c. 36: 23 (1913).

Roux 2009: Synonym of *Didymoglossum erosum* (Willd.) J.P.Roux

*Trichomanes muscoides* of Hook. Syn. Fil. 75 (1867), partly, not of Sw.

On trees in forest at higher elevations; up to 6,000 ft. alt.

**S.Nig.:** Bakebe Hill Savory 633 (BM). **Br.Cam.:** above Buea Box 3608 (BM), Preuss (BM); Cam. Mt. Adams 1316 (BM). **F.Po:** St. Isabel Peak Adams 1163 (BM), Mann 327 (K).

6. *Trichomanes mannii* Hook. Syn. Fil. 75 (1867); Taton l.c. 30, t. 3, fig. M (1846); Tard. l.c. 45, t. 4, fig. 13–15 (1953).

Roux 2009: Synonym of *Crepidomanes mannii* (Hook.) J.P.Roux

*Gonocormus mannii* (Hook.) Copel. in Phil. Journ. Sci. 67: 102 (1938).

On rocks and trees in montane forest; 2,000 to 5,900 ft. alt.

**Fr.G.:** Nimba Mts. Abbayes 625 (BM). **S.L.:** Loma Mts. Jaeger 414 (BM, K, NJ), 1689 (K); Sugar Loaf Mt. Barter (K). **Lib.:** Bilimu Harley 194 (BM), 1993 (K). **Iv.C.:** Mt. Tonkoui Abbayes 555 (BM), 578 (BM), 579 bis (BM); Haut Cavally Chev. 21382 (P). **Br.Cam.:** Cam. Mt. Adams 1330 (BM), Savory 551 partly (BM); Bamenda Rosevear (BM); Mopanya Kalbreyer 154 (BM); Mimbia to Lyonga, Victoria Richards 4127 (BM, K). **F.Po:** Mann (K); St. Isabel Peak Adams 1148 (BM); near Ilache Falls Adams 1082 (BM), 2961 (K); Musola Mildbr. 7057 (B).

Also in **S. Tomé**, southwards to Angola (Carisso & Mendonça 522) and eastwards to Uganda (Synge 835) and Tanganyika.

7. *Trichomanes clarenceanum* Ballard in Kew Bull. 1937: 346.

Roux 2009: Synonym of *Crepidomanes clarenceanum* (Ballard) Pic.Serm.

*Didymoglossum dilatatum* V.d. B. l.c. 144 (1863).

*Trichomanes frappieri* of Tard. l.c. 45 (1953), not of Cardau.

On trees; 2,000 to 5,000 ft. alt.

**Lib.:** Bilipia Harley 215 (BM). **S.Nig.:** British Obokum Keay FHI 28288 (BM), **Br.Cam.:** Buea Rosevear (BM). **F.Po:** St. Isabel Peak Adams 1160 (BM), Mann 331 (K).

8. *Trichomanes chevalieri* Christ in Bull. Soc. Bot. Fr. 55, Mém. 8: 106 (1908).

Roux 2009: Synonym of *Crepidomanes chevalieri* (H.Christ) Ebihara & Dubuisson

*Trichomanes mettenii* of Tard. l.c. 43, t. 4, fig. 16, 17 (1953), partly.

On trees, including mangroves; at low elevations.

**Fr.G.:** Guerzès Country Chev. 20925 (P). **S.L.:** Rokupr P. Adames 118 (BM, NJ). **Lib.:** Tondi Harley 146 (BM); Sanokwele Baldwin 9626 (K). **Iv.C.:** Bouroukrou Chev. 16886 (F). **Ghana:** Odumase, Volta River F.R. Adams 377 (BM); Bana Hill, Krobo Irvine 2882 (BM); Aburi Johnson (K). **S.Nig.:** banks of Nun R. Mann 539 (K). **Br.Cam.:** Wum L., Bamenda Savory UCI 332 (BM); Bakangili, Victoria Thorold CP 2 (BM); Tombel, on Nyasoso Road Thorold CP 6 (BM); Cam. Mt. Dunlap (K) **F.Po:** Ureka Thorold 22 (BM).

Also in **Ubangi** and **French Congo**.

9. *Trichomanes mettenii* C. Chr. Ind. Fil. 644 (1906); Tard. l.c. 43 (1953), partly.



Roux 2009: Synonym of *Crepidomanes mettenii* (C.Christ) Ebihara & Dubuisson

*Trichomanes subsessile* Mett. ex Kuhn Fil. Afr. 37 (1868); Bak. Syn. Fil. 465 (1874), not of Splitg. (1840).

On tree trunks and rocks, in rain forest and fringing forest; up to 1,000 ft. alt.

**S.L.:** Bikongo Falls, Sewa R., Jaima Dawe 54 (BM, NJ), 541 (K). **Lib.:** S. of Kitoma Harley 155 (BM); Piatah Baldwin 12201 (K). **Iv.C.:** Mt. Orombo–Boka Abbayes 453 (BM). **Ghana:** Begoro Adams 255 (BM); R. Kakum, Asuansi Box 2481 (BM); Nfuom, Kakum F.R. Box 2918 (BM); Otokpe Adams GC 562 (K). **S.Nig.:** Shasha F.R. Ross 183 (BM), Richards 3437 (BM), 3415 (BM), 3191a (BM); Alafara to Obutu Jones & Onochie FHI 17566 (BM); Idanre Richards 3790 (K); Owo F.R. Jones FHI 3560 (BM); Okomu F.R. Richards 3668 (BM, K); Ukpom F.R. Jones FHI 14118 (K). **Br.Cam.:** Johann–Albrechtshöhe Staudt 454 (BM, K); Tiko Dunlap 270 (K).

Also on Annobon, southwards to Belgian Congo (Vanderyst 7541), and in Uganda (Taylor 3220).

10. *Trichomanes borbonicum* V.d.B. in Ned. Kr. Arch. 5, 2: 158 (1861); Tard. in Mém. I.F.A.N. 28: 44, t. 4, fig. 11, 12 (1953), partly.

Roux 2009: Synonym of *Polyphlebium borbonicum* (Bosch) Ebihara & Dubuisson

*Trichomanes goetzei* Hieron. in Engl. Bot. Jahrb. 28: 339 (1900); Taton In Bull. Soc. Roy. Bot. Belg. 72; 34, t. 3, fig. A–B (1946).

On trees; about 3,000 ft. alt.

**Br.Cam.:** Mopanya Kalbreyer 186 (BM, K); Cam. Mt. Mann 1400 (K). **F.Po:** Mann (K), 32 (K); St. Isabel Peak Adams 1138 (BM), 3026 (K).

Also on S. Tomé and eastwards to Tanganyika and S. Rhodesia (Fisher & Schweickerdt 323); also in Mascarene Islands.

11. *Trichomanes fallax* Christ in Ann. Mus. Congo, sér. 5, 3: 27 (1909); Taton l.c. 36, t. 3, fig. G–H (1946); Tard. l.c. 43, t. 4, fig. 7, 8 (1953).

Roux 2009: Synonym of *Crepidomanes fallax* (H.Christ) Ebihara & Dubuisson

*Trichomanes latilobum* Bonap. in Chev. Bot. 755 (1920), name only.

*Vandenboschia fallax* (Christ) Copel. in Phil. Journ. Sci. 67: 52 (1938).

On granite rocks in forest.

**Fr.G.:** Ziam Massif Schnell 2611 (P). **Iv.C.:** Sampleu to Ganhoué Chev. 21140 (BM, K). **Ghana:** base of Abetifi Hills, Kwahu Johnson 653 (K).

Also in Belgian Congo, Uganda (Milburn 35) and Madagascar.

12. *Trichomanes africanum* Christ in Journ. de Bot. 22: 21 (1909); Taton l.c. 32, t. 3, fig. C–D (1946); Tard. l.c. 44, t. 4, fig. 9, 10 (1953).

Roux 2009: Synonym of *Crepidomanes africanum* (H.Christ) Ebihara & Dubuisson

*Vandenboschia africana* (Christ) Copel. l.c. 101 (1938).

*Trichomanes melanorichum* of Tard. l.c. 46, t. 5, fig. 1 & 2 (1953), partly.

*Trichomanes borbonicum* of Tard. l.c. 44, partly.

On trees and rocks in forest; up to 5,500 ft. alt.

**Fr.G.:** Dalaba, Fouta Djallon Abbayes 689 (BM). **Lib.:** Kitomu Baldwin 13139 (BM); Bilimu Harley 192 (BM); Truo Baldwin 11394 (BM, K); Sanokwele Baldwin 13131 (BM), 9501 (K). **Iv.C.:** Malamalasso Chev. 17527 (BM, K, P); Mt. Tonkoui Abbayes 554 (BM); Mt. Dou, Gouekangouéae Chev. 21424 (P); Yapo Forest N. of Abidjan Abbayes 255 (BM). **Ghana:** Atewa Range, Kibi Mts. Box 3503 (BM). **Togo:** Waribo Mt. 2,660 ft. Adams 1826 (BM), 3857 (BM); Avatime Mt. Johnson 747 (K). **S.Nig.:** Orosun, Idanre Hills Keay FHI 25520 (BM); Afi River F.R. Jones & Onochie FHI 18605 (BM), 18955 (BM), 18789 (BM); Oban Talbot (BM). **Br.Cam.:** Cam. Mt. Adams 1240 (BM), 1238 (BM), Savory 551 partly (BM); above Buea Bornmüller 1 (P), 2 (P); Bopo, S. Bakundu F.R. Richards 4043 (BM, K); Mann's Spring Brenan 4303 (BM, K), Richards 4185 (BM, K); Bigundi Schlechter 12360 (BM, P); Tiko Dunlap 259 (K); Bakebe Hill Savory 632 (BM). **F.Po:** Mann (BM), 328 (K); Moka Adams 1098 (BM); Batosi Dusen (P); Kitta Dusen (P).

Also in Annobon and south to Belgian Congo.

13. *Trichomanes crispiforme* Alston in Exell Cat. S. Tomé 57 (1944); Tard. l.c. 46, t. 5, fig. 3, 4 (1953); Harley in Contr. Gray Herb. 177: 77 (1955).

Roux 2009: Accepted name

*Trichomanes crenatum* V.d. B. l.c. 205 (1863), not of Gilib. (1792).

On trees In deep shade in forests.

**Lib.:** Butaw, Sinoe Co. Baldwin 11492 (ex Harley). **S.Nig.:** Old Calabar Kalbreyer 208 (BM, K); banks of the R. Nun Mann 538 (K); Brass Barter 1817 (K).

Also in Principe, S. Tomé and Annobon and south to Belgian Congo (Callens 3136).

14. *Trichomanes giganteum* Bory ex Willd. Sp. PL. 5: 514 (1810); Hook. Syn. Fil. 87 (1866); Tard. l.c. 45.

Roux 2009: Synonym of *Vandenboschia gigantea* (Bory ex Willd.) Pic.Serm.

Epiphyte creeping on tree trunks up to 9 ft., in forest; 3,800 to 5,300 ft. alt.

**S.Nig.:** Ikwetee–Balegete path Savory & Keay FHI 25198 (BM). **Br.Cam.:** Mann's Spring Adams 1709 (BM), Richards 4316 (BM, K); Mimbria to Lyonga Brenan 4125 (BM, K); Cam. Mt. Johnston 143 (BM, K), Mann 1398 (K). **F.Po:** Mann (BM); Clarence Peak Mann 669 (K); Moka Adams 1118 (BM), 3003 (K).

Also in S. Tomé, Tanganyika and Mascarenes.

15. *Trichomanes guineense* Afzel. ex Sw. in Schrad. Journ. für Bot. 1800, 2: 96 (1801); Tard. l.c. 48, t. 5, fig. 5, 6 (1953).

Roux 2009: Synonym of *Abrodictyum guineense* (Afzel. ex Sw.) J.P.Roux

*Trichomanes hartii* Bak. in Gard. Chron. n.s. 18: 680 (1882).

*Trichomanes latisectum* Christ in Journ. de Bot. 22: 20 (1909).

*Trichomanes batrachoglossum* Copel. in Phil. Journ. Sci. 51: 244, t. 50, 51, fig. 1, 2 (1933).



Terrestrial, in damp shade on banks, at low elevations.

**S.L.:** Hart (K); near mouth of Kissy Stream Johnston (BM), 15 (K); Freetown Milne–Redhead 5187 (BM, K), A. P. D. Jones 639 (BM). **Lib.:** Kitomu Harley F. 163 (BM, K); Dukwia R. Cooper 38 (K); Cess R. Baldwin 11293 (K); Moylakwelli to Totokwelli Linder 1291 (K); Tappita Baldwin 9102 (K). **iv.C.:** Téké Forest, N. of Abidjan Abbayes 298 (BM); Yapo Forest, Abidjan Abbayes 263 (BM). **Ghana:** Nfuom, Kakum F.R. Box 2934 (BM); bed of R. Bediabewa Cudjoe 37 (BM, K); Ancobra R. Johnson 861 (K); Bonsa Junction Johnson 861 (K); Axim Irvine 2246 (K). **S.Nig.:** Omo (formerly part of Shasha) F.R. Richards 3355 (BM); Okomu F.R. Richards 3674 (BM, K), 3602 (BM, K); Old Calabar Brodie (K). **Br.Cam.:** W. of Bopo, S. Bakundu F.R. Richards 4041 (BM, K).

16. *Trichomanes cupressoides* Desv. in Mém. Soc. Linn. Par. 6: 330 (1827); Tard. l.c. 46, t. 5, fig. 7, 8 (1953).

Roux 2009: Synonym of *Abrodictyum cupressoides* (Desv.) Ebihara & Duboisson

*Trichomanes rigidum* of Hook. Syn. Fil. 86 (1866), partly, not of Sw.

Wet rocks and banks by streams in forest; up to 5,200 ft. alt.

**Lib.:** Bilimu Harley F. 78 (BM, K), 1991 (K); Bili Barker 1174 (K); Bobei Mts. Sanokwele Baldwin 9613 (K). **Ghana:** Puso Puso Box 3265 (BM), Adams 340 (BM), 569 (K); Atewa Range, Kibi Mts. Box 3501 (BM). **S.Nig.:** Ikwette, Obudu Div. Savory & Keay FHI 25177 (BM); R. Ata, Obudu Div. Savory & Keay FHI 25119 (BM). **Br.Cam.:** Mafura to Mundame Schlechter 12916 (BM, K). **F.Po:** Moka Adams 2916 (K).

Also in other parts of tropical Africa, Annobon, Natal and the Mascarenes.

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2. *HYMENOPHYLLUM* Sm. — Hook. Syn. Fil. 56 (1866); Sim F.S.A. 73 (1915).

1 Fronds completely glabrous: 2

Fronds with stellate hairs: ----- 3

2 Margin sharply toothed; fronds deltoid; receptacle equalling the lobe of the involucre 1. *triangulare*

Margin entire; fronds narrowly oblong; receptacle much shorter than the lobe of the involucre ----- 2. *kuhnii*

3 Rhachis and stipe not winged; stellate hairs present on the leaf-surfaces 3. *capillare*

Rhachis and stipe winged:----- 4

4 Stellate hairs borne only on the veins and margins; wing of rhachis usually crisped; fronds up to 15 cm. long 4. *hirsutum*

Stellate hairs present on the leaf-surfaces; wing of rhachis plane; frond up to 30 cm. long ----- 5. *splendidum*

1. *Hymenophyllum triangulare* Bak. in Hook. Syn. Fil. 69 (1867); Hook. Ic. Pl. t. 1613 (1886); Copel. to Phil. Journ. Sci. 64: 67 (1937); Tard. In Mém. I.F.A.N. 28: 38, t. 3, Fig. 8, 9 (1953).

Roux 2009: Accepted name

*Hymenophyllum mannianum* Mett. ex Kuhn Fil. Afr. 40 (1868).

Epiphytic on branches of trees, in cloud forest; 3,000 to 4,000 ft. alt.

**F.Po:** Mann 333 (K); near Ilache Falls Adams 1072 (BM); St. Isabel Peak Adams 1139 (BM); Moka Guinea 2165 (BM).

Also in French Camerouns (Zenker 3879).

2. *Hymenophyllum kuhnii* C.Ch. Ind. Fil. 363 (1905); Copel. in Phil. Journ. Sci. 64: 106, t. 48 (1987); Taton in Bull. Soc. Roy. Bot. Belg. 78: 22, t. 1, Fig. K–L (1946); Tard. l.c. 38, t. 3, fig. 6, 7 (1953).

Roux 2009: Accepted name

*Hymenophyllum henkelli* T.R. Sim in S. Afr. Journ. Sci. 20: 309, t. 9 (1923).

*Hymenophyllum meyeri* Kuhn in Engl. Hochgeb. Trop. Afr. 94 (1892), not of Presl (1843).

Epiphytic on trees mainly in montane forest; up to 5,000 ft. alt.

**Fr.G.:** Ziama Massif Schnell 2706; Mt. Nimba Schnell 1047, 1166 (all ex Tard.). **S.L.:** Sugar Loaf Mt. Barter (K). **Lib.:** Bili Harley F. 214 (BM); Bilimu Harley F. 193 (BM, K), 1982 (BM). **S.Nig.:** Oban Talbot (BM). **Br.Cam.:** Mopanya Kalbreyer 187 (BM); below Liwonge Richards 4314 (BM, K.). **F.Po:** Mann (BM), 329 (K), 386 (K).

Also in S. Tomé and Annobon and widespread in E. Africa.

3. *Hymenophyllum capillare* Dew. in Mém. Soc. Linn. Par. 6: 333 (1827); Copel. l.c. 170 (1937); Taton l.c. 19, t. 1, fig. C–F (1946); Tard. l.c. 36, t. 3, fig. 1 (1953).

Roux 2009: Accepted name

*Hymenophyllum pendulum* Bory in Bélange Voyage, Bot. 2: 81, t. 8, fig. 2 (1833).

*Hymenophyllum holotrichum* Peter in Fedde Rep. Beih. 40: 16, t. 1, fig. 3, 4 (1929).

On trees in forest.

**Br.Cam.:** path to Mann's Spring Adams 1708 (BM); below Liwonge Richards 4315 (BM, K).

Widespread in E. Africa, the Mascarene Islands and Tristan da Cunha.

4. *Hymenophyllum hirsutum* (Linn.) Sw. in Schrad. Journ. für Bot. 1800,2: 99 (1801), emend. Morton in Contrib. U.S. Nat.Herb. 29: 155, 173 (1947).

Roux 2009: Accepted name

*Trichomanes hirsutum* Linn. Sp. PL. 2: 1098 (1753).

*Hymenophyllum ciliatum* Sw. in Schrad. l.c. 100 (1801); Hook. Syn. Fil. 63 (1866), partly; Copel. l.c. 168 (1937); Taton l.c. 17, t. 1, Fig. A–B (1946), partly; Tard. l.c. 38, t. 3, Fig. 4, 5 (1953).

On trees in forest; about 3,800 ft. alt.

**Lib.:** Kulo Baldwin 11424 (K); Bilimu Harley 1985 (BM). **Iv.C.:** banks of R. Gonée Abbayes 2180 (BM). **F.Po:** Mann 334 (K); Ilache Falls Adams 1068 (BM).

Also in tropical America and the Mascarene Islands.

5. *Hymenophyllum splendidum* V.d.B. in Ned. Kr. Arch. 192 (1863); Copel. l.c. 174 (1937); Tard. l.c. 36, t. 3, fig. 2, 3 (1953).

Roux 2009: Accepted name

Epiphytic on branches and trunks of trees, in wet submontane forest; 1,000 to 5,500 ft. alt.

**Br.Cam.:** Johnston 147 (BM); Cam. Mt. Mann 1397 (K); Mopanya Kalbreyer 176 (BM, K); Mimbia to Lyonga Richards 4126 (BM, K); below Liwonge Richards 4319 (BM, K). **F.Po:** Mann 332 (K); St. Isabel Peak Adams 1137 (BM).

Also in S. Tomé.

## 15. DENNSTAEDTIACEAE

Rhizomes creeping, hairy, vascular system solenostelic or in *Pteridium* a complex double solenostele; stipes with convoluted undivided vascular strands, which are sometimes U-shaped or with a system of several bundles in a horseshoe arrangement. Fronds large tripinnate, or quadripinnate, often continuing apical growth for a considerable period. Stipes often with two pallid lateral lines (ventilating areas) and sometimes with pulvinus-like nectaries at the base of the pinnae. Veins free or anastomosing. Costae usually grooved on the upper surface with the basicopic edge of the groove of the lateral rhachides decurrent on the edge of the main rhachis (*Hypolepis*, *Pteridium*). Sori marginal or submarginal, punctate or linear. Indusium wanting, cup-shaped or linear, or sometimes with the leaf-margin modified to form a false indusium. Sporangia sometimes with annulus of 14–20 indurated cells passing just on one side of the stalk intermediate between the gradate and mixed condition, rather short-stalked with long cells on the centre and short cells at the ends, often mixed with multicellular hair-like paraphyses. Spores trilete or monolete. Gametophyte dioecious in *Dennstaedtia punctilobula*, glabrous; antheridium with a unicellular cap cell.

- 1 Sori punctate, submarginal: 2  
Sori elongate, marginal; indusium opening inwards, or two indusia present: ----- 3
- 2 Indusium thin, cup-shaped, opening outwards; spores trilete, smooth 1.  
*Microlepia*  
Indusium wanting (in W. African species), but sori sometimes protected by a small thin reflexed lobe of the lamina;  
spores monolete, spinulose ----- 2. *Hypolepis*
- 3 Paraphyses none; two indusia present one on either side of the sorus; spores  
trilete 3. *Pteridium*  
Paraphyses present (in W. African species); indusium represented by modified flap of the lamina, opening inwards:  
----- 4
- 4 Venation free; spores trilete 4. *Anisosorus*  
Venation reticulate; spores monolete: ----- 5
- 5 Fronds hirsute, dark green 5. *Lonchitis*  
Fronds glabrous, glaucous ----- 6. *Histiopteris*

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### 1. *MICROLEPIA* Presl — Sim F.S.A. 129 (1915); Copel. Gen. 51 (1947).

Large terrestrial ferns growing in clumps, with short-creeping rhizomes with 2 rows of stipes; stipes covered with short hairs, with a single U-shaped vascular strand; lamina deltoid, tripinnate or tripinnatifid (in W. African species); sori terminal on veins, not marginal, with a thin cup-shaped indusium which opens outward and is attached at the base and sides; spores trilete.

*Microlepia speluncae* (Linn.) Moore Ind. Fil. xcii (1857); Sim F.S.A. 129, t. 38 (1915);

Tard. in Mém. I.F.A.N. 28 : 58, t. 7, fig. 3–5 (1953).

Roux 2009: Accepted name

*Polypodium speluncae* Linn. Sp. PL. 2 : 1093 (1753).

*Davallia speluncae* (Linn.) Bak. in Hook. & Bak. Syn. Fil. 100 (1867).

In wet places in forest; at low elevations.

**Fr.G.:** Sereidou, Ziama Portères (P). **S.L.:** T. Vogel (K.); Kamasu, Gaura Deighton 4093 (BM, KJ); Leicester Park, Sugar Loaf Mt. Barter (K); Makomba, Kunike Sanda Deighton 4072 (N J); Banda Karafaria T. S. Jones 27 (BM); Mahnoo Mair (K). **Lib.:** Ganta Harley 138 (BM, K), 48 (K); Firestone Plantation Harley 122 (K). **Iv.C.:** Mt. Orombo–Boka Abbayes 401 (BM). **Ghana:** Asuansi Box 2874 (BM); L. Bosumtwi Box 2902 (BM); Puso Puso Ravine Adams 407 (K.); Bompata Vigne FH 2702 (K); Mampong Vigne FH 4098 (K); Akropong Irvine 2613 (K). **Togo:** Amedzofe Scholes 68 (BM). **N.Nig.:** Kontagora Dalz. 246 (K). **S.Nig.:** Lagos Dawodu 309 (K); Omo (formerly part of Shasha) F.R. Richards 3383 (BM), Ross 27 (BM); Idanre Hills Savory UCI 774 (BM); Okomu F.R. Richards 3636 (BM, K), Ros 150 (BM); Obudu Savory & Keay FHI 25276 (BM), 25001 (BM).

Widespread in the tropics of the Old World.

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2. *HYPOLEPIS* Bernh. — Sim F.S.A. 236 (1915); Copel. Gen. 57 (1947).

1 Stipe and rhachis straw-coloured, smooth; pseudo-indusia small, pale, suborbicular, entire; veins with pale hairs *l. sparsisora*

Stipe and rhachis dark purplish, rough; pseudo-indusia large, green, lacerate; veins with dark and pale hairs *2a.*

*rugosula* var. *africana*

1. *Hypolepis sparsisora* (Schrad.) Kuhn Fil. Afr. 120 (1868); Sim F.S.A. 236,t.117 (1915); Tard. Mém I.F.A.N. 28 : 59, t. 7, fig. 1, 2 (1953).

Roux 2009: Accepted name

*Cheilanthes sparsisora* Schrad. in Gött. Gel. 1818 : 918.

*Hypolepis anthriscifolia* (Schlecht.) Presl Tent. Pterid. 162 (1836); Hook. Syn. Fil. 129 (1867), partly.

Open places in montane forest; 4,000 to 6,000 ft. alt.

**Br.Cam.:** below Liwonge, Mann's Spring Richards 4283 (BM, K); Cam. Mt. Adams 1248 (BM), 1260 (BM); Litoka, Cam. Mt. Maitland 1120 (K); above Buea Migeod 77 (BM). **F.Po:** Mann 345 (K); Moka Heights Adams 1105 (BM); Finca Puente Guinea 1685 (BM).

Tropical and S. Africa and Mascarene Islands.

2. *Hypolepis rugosula* (Labill.) J. Sm. in Comp. Bot. Mag. 8 (1846), (by error “rugulosa”).

Roux 2009: Synonym of *Hypolepis goetzei* Hieron. ex Reimers

*Polypodium rugosulum* Labill N. Holl. Pl. Spec. 2 : 92, t. 241 (1806).

*P. punctatum* var. **rugosulum** (Labill.) Hook. Syn. Fil. 312 (1867), not **P. punctatum** of Thunb. (1784), (by error “rugulosum).”

*Dryopteris punctata* C.Ch. Ind. Fil. 287 (1905), partly, excl. syn. Thunb.

2a. *Hypolepis rugosula* var. **africana** C.Ch. in Dansk. Bot. Ark. 7 : 121 (1932).

Roux 2009: Synonym of *Hypolepis goetzei* Hieron. ex Reimers

**F.Po.:** Mann(BM).

The var. *rugosula* occurs in New Zealand, New Caledonia and Chile and the var. *africana* in Madagascar and the mountains of Central and East Africa.

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3. **PTERIDIUM** Scop. — Sim F.S.A. 263 (1915); Copel. Gen. 59 (1947).

Terrestrial ferns with elongate, subterranean rhizomes, gregarious; stipes long with numerous vascular bundles; fronds triangular in outline, tripinnate to quadripinnatifid; sori linear, marginal, with a delicate hyaline indusium on the inner side and a false indusium consisting of the reflexed edge of the lamina; spores trilete.

*Pteridium aquilinum* (Linn.) Kuhn in Deck. Reisen Ost–Afr. 3, 3, Bot. 11 (1879); Tard. in Mém. I.F.A.N. 28 : 67 (1953).

Roux 2009: Accepted name

*Pteris aquilina* Linn. Sp. Pl. 2 : 1075 (1753); Hook. Syn. Fil. 162 (1867).

*Pteris lanuginosa* Bory ex Willd. (1810).

*Pteridium aquilinum* subsp. **typicum** Tryon In Rhodora 43 : 15(1941).

Locally abundant in open places up to 7,000 ft. alt.

**Fr.G.:** Fouta Djallon Heudelot 883 (BM, K), Pobéguin 1 (K). **S.L.:** Smeathmann (BM), Afzelius (BM), Don (BM); Freetown Welwitsch 6 (BM); Bagroo R. Mann 908 (K); Mahnoo Mair (K); Njala Deighton 726 (K, NJ); Taiama Deighton (NJ). **Lib.:** Port MarshaU Fraser 4 (BM), Krammer 7 (BM); Dukwia R. Cooper 21 (K). **Iv.C.:** Adiopodoumé, N. of Abidjan Abbayes 209 (BM). **Ghana:** Kumasi Box 2903 (BM); Begoro Adams 462 (BM, K); Mampong Box 2930 (BM). **Togo:** Amedzofe Box 3434 (BM); Togo Plateau F.R. St. C. Thompson 1513 (K). **N.Nig.:** Vom, Jos Plateau Dent Young 273 (K). **S.Nig.:** Sapoba Richards 3929 (BM); New Calabar R., Port Harcourt Wolff 21 (BM); Mt. Koloishe Obudu Div. Savory & Keay FHI 25083 (BM), 25113 (BM); Udi Plateau Jones FHI 1073 (BM). **Br.Cam.:** above Buea Box 3611 (BM); Cam. Mt. Johnston 111 (BM), Mann 1380 (K), Maitland 836 (K); above Lyonga, Mann’s Spring Richards 4378 (BM); Mann’s Spring Richards 4281 (BM); Tiko Dunlap 182 (K); Bamenda Migeod 446 (K). **F.Po.:** T. Vogel 205 (K); Moka Exell 807 (BM).

Cosmopolitan but divisible into several subspecies or species. The West African form is similar to that of Western Europe.

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4. **ANISOSORUS** Trev. ex Maxon Pterid. Puerto Rico 429 (1926). *Pteris* of Copel. Gen. 61 (1947), partly.

Large terrestrial ferns with short–creeping fleshy rhizome; rhizome with spreading septate translucent hairs; fronds large ovate–deltoid, with long stipes, bipinnate or

tripinnatifid, succulent; veins free, pinnate, rarely forming a few large areoles along the costa; sori marginal, short, straight or lunulate, often occupying the base of a sinus, indusium consisting of modified marginal flap, opening inwards; spores trilete.

*Anisosorus occidentalis* (Bak.) C.Ch. in E. Perrier Cat. Pl. Madag. Ptérid. 54 (1931); Tard. in Mém. I.F.A.N. 28 : 85 (1953).

Roux 2009: Synonym of *Lonchitis occidentalis* Baker

*Lonchitis occidentalis* Bak. in Hook. Syn. Fil. 128 (1867).

By streams in forest, up to 4,000 ft. alt.

**Fr.G.:** Kabiata, Nzérécoré Adam 5036 (P); Bérézia Chev. 20779 (P). **S.L.:** Makati Deighton 4070 (NJ). **Lib.:** Beiding Harley F. 158 (BM, K). **Ghana:** Puso Puso Adams 87 (BM), 321 (BM), 507 (K). **S.Nig.:** R. Ata, below Mt. Koloishe, Obudu Div. Savory & Keay FHI 25033 (BM). **Br.Cam.:** Cam. Mt. 4,000 ft. Mann (BM), 1386(K); Buea Annet 90 (ex Tard.). **F.Po.:** Barter 2048 (K).

Extends eastwards to Tanganyika (Bruce 71; Schlieben 3938) and southwards to Angola (Welwitsch 1329), also in S. Tomé (Moller 14), and with var. *malgassica* C.Ch. in Madagascar.

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5. *LONGCHITIS* Linn. — Sim F.S.A. 261 (1915); Kümmerle Bot. Közlem. 14: 168 (1915). Pteris of Copel. Gen. 61 (1947), partly.

- 1 Sori small, semicircular, mostly at the base of the sinuses; upper part of rhachis densely villous with long jointed hairs; lobes rounded; pinnae not acuminate: 2  
Sori large, interrupted, occupying the marginal sinuses: ----- 4
- 2 Tripinnatifid; pinnules stipitate but winged to the base; apical cells of paraphyses large, curved 1. *gracilis*  
Bipinnate or pinnate; pinnae shortly stipitate: ----- 3
- 3 Fronds light green; pinnate or rarely bipinnate; apical cells of paraphyses large, slightly curved, subobtuse 2. *reducta*  
Fronds dark green; bipinnate; apical cells of paraphyses small, not curved, subacute ----- 3. *tisserantii*
- 4 Upper part of rhachis subglabrous; pubescence mainly confined to the veins; pinnate or bipinnate; lobes mostly acuminate 4. *currori*  
Upper part of rhachis villous with long, jointed hairs; pubescence on veins and on areoles; pinnate; lobes not acuminate ----- 5. *mannii*

1. *Lonchitis gracilis* Alston in Exell Cat. S. Tomé, Suppl. 7 (1956).

Roux 2009: Synonym of *Blotiella glabra* (Bory) R.M.Tryon

**Br.Cam.:** Cam. Mt. Mann 2052 (K); below Liwonge, Mann's Spring Richards 4245 (BM, K). **F.Po.:** Mann (K); Moka Adams 1100 (BM).

Also in S. Tomé

2. *Lonchitis reducta* C. Chr. in Fedde Rep. 9 : 370 (1911); Tard. in Mém. I.F.A.N. 28: 81 (1953), partly.

Roux 2009: Synonym of *Blotiella reducta* (C.Chr.) R.M.Tryon

*Lonchitis natalensis* of Tard l.c.

Under rocks at about 3,000 ft. alt., and in wet places in forest at lower levels.

**Fr.G.:** Pita, Fouta Djallon Pobéguin 28 (BM, P), 35 (P); Béréguiza Adam 7549 (P); Ziamma Adam 4282 (P); Pita Pobéguin 25 (P). **Iv.C.:** Abidjan to Aniamma–Adjamé Escard (P); Anguédédou Forest Abbayes 364 (P). **Ghana:** Ankeraso Darko 45 (BM); Basakeh, Axim Cudjoe 43 (BM); Asuansi Box 1434 (BM); Princes R. Burton & Cameron (K); Kumasi Cummins 110 (K); Neung F.R., Tarkwa Adams 2762 (K). **F.Po:** Mann (BM).

3. *Lonchitis tisserantii* Alston & Tard. in Mém. I.F.A.N. 28: 85,t.13, fig. 5, 6 (1953).

Roux 2009: Synonym of *Blotiella tisserantii* (Alston & Tardieu) Pic. Serm.

1,500 to 4,000 ft. alt.

**Br.Cam.:** Bamenda Rosevear (BM). **F.Po:** Mann (BM), 350 (K), 357 (K),  
Also in Ubangi.

4. *Lonchitis currori* (Book.) Mett.ex Kuhn in Deck. Reisen Ost–Afr. 3, 3, Bot. 10 (1879); Tard. l.c. 82 (1953), partly, excl. syn.

Roux 2009: Synonym of *Blotiella currorii* (Hook.) R.M.Tryon

*Pteris mannii* Bak.

*Pteris currori* Hook. Sp. Fil. 2: 232, t: 140 (1858); Syn. Fil. 168 (1867).

In swampy places in forest; at elevations below 1,000 ft.

**Fr.G.:** Macenta Adams 3453 (P), 3018 (P). **S.L.:** Zimi to Gorahun Deighton 4094 (BM, NJ); Makali Deighton 4073 (NJ); Neaboi Valley, Kambui Hills Small 891 (K, NJ). **Lib.:** Bilimu Barley 1989 (BM), 60 (K); Ganta Harley 36 (K); Mt. Bili Barker 1157 (K); Gbanga Linder 640 (K). **Iv.C.:** Assinie Chaper (P). **Ghana:** Puso Puso Adams 337 (BM); Kakum F.R. Box 2913 (BM), 2866 (BM), 2851 (BM); Asuansi Box 2051 (BM), 2098 (BM); Bompata Vigne PH 2709 (K); Bobiri F.R. Adams 549 (K). **Dah.:** Porto Novo Circle Chev. 22872 (P).

Also in Principe and S. Tomé and widespread in tropical Africa.

5. *Lonchitis mannii* (Bak.) Alston in Bol. Soc. Brot., sér. 2A, 30 : 18 (1956).

Roux 2009: Synonym of *Blotiella currorii* (Hook.) R.M.Tryon

*Pteris mannii* Bak. in Hook. Syn. Fil. 168 (1867).

*Litobrocchia mannii* (Bak.) J. Sm. Hist. Fil. 291 (1875).

*Lonchitis reducta* of Tard. l.c., partly.

Terrestrial; about 2,000 to 5,000 ft. alt.

**Fr.G.:** Mt. Nimba Schnell 439 (P), 475 (P); Pita Pobéguin 29 (P); Ditinn, Fouta Djallon Abbayes 865 (BM, P), Pobéguin 36 (P). **Lib.:** Mt. Bili Barker 1178 (K). **N.Nig.:** Patt Lokoja Dalz. 245 (K). **S.Nig.:** Ikwette, Obudu Div. Savory & Keay FHI 25180 (BM). **F.Po:** Mann (K).



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6. *HISTIOPTERIS* (Ag.) J. Sm. — Sim F.S.A. 262 (1915); Copel. Gen. 60 (1947).

Terrestrial ferns with wide-creeping rhizomes clothed with hairs; stipes long and slender; fronds large, glaucous, with opposite pinnae, tripinnate, with a pair of reduced stipule-like pinnules at the base of each pinna, ultimate pinnule entire or sinuately lobed; veins anastomosing without free veinlets; sori linear, marginal, more or less covered by the reflexed margin of the lamina; spores monolete.

*Histiopteris incisa* (Thunb.) J. Sm. Hist. Fil. 295 (1875); Sim F.S.A. 263, t.133 (1915); Engl. Pflanzenw. Afr. 2: 45, Fig. 41 (1908); Tard. in Mém. I.F.A.N. 28: 67 (1953).

Roux 2009: Accepted name

*Pteris incisa* Thunb. Prod. Fl. Cap. 171 (1800); Hook. Syn. Fil. 172 (1867).

Open ground from near sea level to 4,000 ft.

**Fr.G.:** Nzérékoré Adam 3271, 3282; Laloffa Adam 4988; Macenta Adam 4761; Boula Col Schnell 122; Pita Pobéguin 4 (all ex Tard.). **S.L.:** Regent to Bathurst Johnston (BM), 85 (K). **Lib.:** Sakimpa Harley 116 (BM, K). **Iv.C.:** Zuguépo, Nzo, at foot of Mt. Nimba Abbayes 2122 (BM). **F.Po:** Moka Exell 830 (BM), Adams 1032 (BM); Moka to Ilache Adams 1053 (BM), 2932 (K).

Tropical mountains generally.

## 16. VITTARIACEAE

Epiphytes; roots with copious dark root-hairs; rhizome creeping or suberect, dictyostelic or solenostelic, with clathrate scales. Fronds usually pendulous, simple, glabrous, with idioblastic sclereids in the epidermis, venation reticulate, without included, free vein ends. Sori elongate along the veins, exindusiate; paraphyses usually present, sometimes branched, slender, often with large club-shaped or obconic terminal cells; annulus vertical, 12–16 celled, interrupted, dehiscence horizontal. Stalks relatively short, sometimes only one cell thick. Spores trilete or monolete, without perispore. Gametophyte ribbon-like, branching; older parts bearing archegonia on cushions; antheridia on surface and margin; gemmae produced and antheridia often borne on filaments arising from the gemmae.

- 1 Sori elongate along the veins, forming an irregular network; fronds elongate, elliptic to suborbicular *1. Antrophyum*  
Sori elongate, marginal; fronds linear -----2. *Vittaria*
- 

### 1. *ANTROPHYUM* Kaulf. — Copel. Gen. 223 (1947).

- 1 Fronds oblanceolate, up to 15 cm. long and 2.5 cm. broad; stipes green, short, up to 2.5 cm. long; sori immersed; paraphyses capitate *1. immersum*  
Fronds obovate-orbicular, acuminate, about 17 cm. long and 14 cm. wide, stipes black, longer than lamina; sori superficial; paraphyses clavate *2. mannianum*

1. *Antrophyum immersum* (Bory ex Willd.) Mett. in Ann. lugd. Bat. 4: 171 (1868–9); Hook. Syn. Fil. 393 (1868).

Roux 2009: Accepted name

*Hemionitis immena* Bory ex Willd. Sp. Pl. 5: 127 (1810).

? *A. annetii* (Jeanp.) Tard. in Mém. I.F.A.N. 28: 205, t. 40, fig. 6 (1953).

**Lib.:** on Cola trees, Wanau Harley 218 bis (BM), 227 (BM), 1981 (K); Bilimu Harley 216 (BM).

Also In the Mascarene Islands.

2. *Antrophyum mannianum* Book. Sec. Cent. Ferns t. 73 (1861); Syn. Fil. 394 (1868); Engl. Pflanzenw. Afr. 2: 48, fig. 44 (1908); Tard. l.c. 204, t. 40, fig. 5 (1953).

Roux 2009: Accepted name

On trees and rocks in shade, near rivers; up to 5,000 ft. alt.

**Fr.G.:** Macenta Baldwin 9767 (K). **S.L.:** Kono Dawe 528 (BM, K, NJ); Sini-Koro, near Loma Mts. Jaeger 1814 (K); Bagroo B. Mann (K). **Lib.:** Kitomu Baldwin 13142 (BM); Gbeidin Harley F. 222

(BM); Bilimu Harley 100 (K); Nekabozu Baldwin 9963 (K); Genne Tanyehun Baldwin 10730 (K); Zwedru Baldwin 7063 (K). **Iv.C.:** Mt. Momy, Haut Cavally Chev. 21363 (P). **S.Nig.:** Oban Talbot (BM). **Br.Cam.:** Cam. Mt. Mann 1364 (K.); Mopanya Kalbreyer 138 (BM); Buea Preuss 594 (BM), Migeod 36 (BM, K); Mimbia to Lyonga Banjo 4128 (K); near Nyanga Camp Maitland 1209 (K). **F.Po:** Mann (BM, K), Newton (K); St. Isabel Peak Adams 1158 (BM), Mann 367 (K).  
Eastwards to Uganda and Tanganyika.

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2. *VITTARIA* Sm. — Sim F.S.A. 267 (1915); Copel. Gen. 225 (1947).

1 Stipes not black at base; small species with fronds up to 15 cm. long; spores monolete *I. owariensis*

Stipes black at base; large species with fronds up to 30 cm. long; spores trilete ----- 2. *guineensis*

1. *Vittaria owariensis* Fée Mém. Fam. Foug. 3 : 21, t. 3, Fig. 2 (1852); Tard. in Mém. I.F.A.N. 28 : 204, t. 40, Fig. 3, 4 (1953).

Roux 2009: Accepted name

*Vittaria elongata* of Hook. Syn. Fil. 395 (1868), partly, not of Sw.

Epiphyte on oil palms in secondary forest at low level.

**Lib.:** Ganta Harley 140 (BM, K). **Ghana:** Asuansi Box 2064a (BM); Aburi Hills Johnson 300 (K). **S.Nig.:** Barter 21 (BM); Lagos Dalz. 1293 (K); Warri Beauvois in Hb. Willd. 20027 (B); Brass Barter 1825 (K).

Also in Principe, S. Tomé and Annobon.

2. *Vittaria guineensis* Desv. in Mag. Ges. Naturf. Freunde Berl. 5 : 325 (1811); Tard. in Mém. I.F.A.N. 28: 202, t. 40, Fig. 1, 2 (1953).

Roux 2009: Synonym of *Vittaria guineensis* Desv. var. *guineensis*

*Vittaria lineata* of Hook. Syn. Fil. 396 (1868), partly, not of Sm.

On trees, in the open and in forest; up to 4,500 ft. alt.

**Fr.G.:** Koundian to Ouria, Kissi Chev. 20770 (K). **S.L.:** Kenema T. S. Jones 315 (BM, NJ); Fluima, Njala Deighton 665 (K, NJ); Sugar Loaf Mt. Barter (K); Konko to Loma Mts. Jaeger 1686 (K). **Lib.:** Cook 487 (US); Begwai Bunting 114 (BM); Suacoco, Gbanga Daniel 415 (BM); Ganta Harley 8 (K); Soplima, Vonjama Dist. Baldwin 10113 (K); Mt. Bili Barker 1167 (K). **Iv.C.:** Bingerville Abbayes 207 (BM). **Ghana:** Asuansi Box 2064 (BM); Nkawkaw Box 3458 (BM); Awaham Adams 520 (K); Mampong Box 2905 (BM); Pra-Anum F.R. Box 2924 (BM). **Togo:** Amedzofe Irvine 3398 (ex Adams); Kpandu Robertson 138 (BM). **S.Nig.:** Lagos Barter 2190 (K), Dalz. 1293 (K); Oluasogo, Omo (formerly part of Shasha) F.R. Ross 231 (BM); Sapoba Meikle 582a (K); Bonny Kalbreyer 81 (K); Calabar Richards 3968 (BM, K.). **Br.Cam.:** Barombi Kang, Kumba Thorold CP 8 (BM); Lyonga to Tongoa, Mann's Spring Richards 4376a (BM, K); below Liwonge, Mann's Spring Richards 4312 (K); Cam. Mt. Mann. 1366 (K). **F.Po:** Mann 124 (K); Moka Exell 848 (BM), Adams 1039 (K); Mazola Guinea 1435 (BM); Ureka Thorold 26 (BM).

Also in Principe and S. Tomé and south to Angola (Gossweiler 10048).

## 17. ADIANTACEAE

Terrestrial ferns; rhizomes short–creeping or suberect, dictyostelic or solenostelic; indumentum of scales which are neither peltate nor clathrate (in W. African species). Stipes with U–shaped vascular strands, 2 or rarely many small bundles (*Ceratopteris*, *Acrostichum*), often black and polished and then with collenchyma–like thickening on the corners of the cells. Fronds usually decompound and deltoid in outline but simple (*Doryopteris*) and pinnate species are known, not articulated to the rhizome. Spine–like setae are sometimes present at the junction of the costae and costules (*Pteris*); rhachis sometimes papillose in the groove at the base of the pinnae. Sori mostly marginal and without true indusia. False indusia may be formed by the modification of flaps of the leaf–margin, these open inwards (e.g. *Adiantum*). Sporangia normally short–stalked with vertical annulus, horizontally dehiscent. Annulus with 16–28 indurated cells. Paraphyses frequent. Spores trilete, without perispore. Gametophytes glabrous, often asymmetrical; antheridia rarely with an asymmetrical cap–cell (*Acrostichum*) sometimes imbedded (*Ceratopteris*), frequently apogamous, sometimes developing an archegoniate cushion or tuberous growth, occasionally with a collenchymatous thickening at the corners of the cells and on the lateral walls (*Adiantum* spp.); dioecious in *Ceratopteris*.

- 1 Sori spreading along the veins or covering the whole undersurface of the frond:  
2 Sori marginal or nearly so; vascular strands 1 — 2: ----- 5
- 2 Paraphyses present; pinnae few, several inches long: 3  
Paraphyses absent; rhizome suberect; fronds decompound with many small pinnules:----- 4
- 3 Rhizome erect, sori covering lower surface; stipes with many steles; texture coriaceous 1. *Acrostichum*  
Rhizome creeping; small paraphyses; sori along the veins; stipes with U–shaped vascular strand; texture herbaceous ----- 3. *Coniogramme*
- 4 Lower surface of frond bearing waxy white powder when young; stipe black and shiny with 2 vascular strands; roadside weed 4. *Pityrogramma*  
Lower surface of frond green; stipe green and fleshy with many steles; water–plant ----- 2. *Ceratopteris*
- 5 Sori arising from the undersurface of the reflexed marginal flaps; steles 2 at base of stipe uniting to form a lunulate or T–shaped stele 5. *Adiantum*  
Sori arising from the surface of the undersurface of the frond: ----- 6
- 6 Paraphyses present (or if not, then texture herbaceous, venation reticulate and gemmae present) 6. *Pteris*  
Paraphyses wanting; texture coriaceous: ----- 7
- 7 Undersurface densely clothed with long jointed and matted hairs (in W. African species) 8. *Notholaena*  
Undersurface glabrous or with short erect hairs:----- 8
- 8 Rhizome wide creeping; sterile tips of pinnae entire 7. *Afropteris*  
Rhizome short, usually suberect:----- 9

- 9 Fronds covered with white powder beneath; indusium continuous (in W. African species) *9. Cheilanthes*  
 Fronds not covered with white powder (in W. African species): -----10
- 10 Stipe terete, black (in W. African species): 11  
 Stipes bisulcate below, green; fronds dichotomously flabellate ----- *13. Actiniopteris*
- 11 Fronds pedate, pentagonal *10. Doryopteris*  
 Fronds pinnate or bipinnate:-----12
- 12 Sori marginal in contact or confluent laterally; false indusium continuous; pinnules oblong *11. Pellaea*  
 Sori in sinuses of the teeth, with reflexed false indusia; fronds finely dissected ----- *12. Aspidotis*

1. *ACROSTICHUM* Linn. — Sim F.S.A. 291 (1915); Copel. Gen. 64 (1947).

Large terrestrial fern growing in or near mangrove swamps; caudex massive short, with large stiff scales at the apex and thick fleshy roots; stipes with numerous vascular bundles; fronds pinnate; pinnae stalked, entire, lower sterile, those at the apex of the frond usually fertile; basal pinnae reduced to small spines (costae) on old fronds; venation closely reticulate without included veinlets; sori covering the entire surface of the fertile pinnae; sporangia mixed with paraphyses; spores trilete.

*Acrostichum aureum* Linn. Sp. Pl. 2 : 1069 (1753); Hook. Syn. Fil. 423 (1868); Sim F.S.A. 292, t.153 (1915); Ogata Ic. Fil. Jap. 7, t. 301 (1936); Tard. Mém. I.F.A.N. 28 : 86 (1953).

Roux 2009: Accepted name

*Acrostichum guineense* Gand. in Bull. Soc. Bot. Fr. 66: 305 (1919).

Clumps in drier parts of mangrove swamps and on riverside and mudflats near the coast, rarely inland.

**Port. G.:** Begene to Farim Esp. Santo 2293 (LISC); Formosa, Acoco Esp. Santo 1990 (LISC). **Fr.G.:** R. Kakimba Schnell 3116, 3200 (ex Tard.); Farmoréah Jac.-Fél. 1691 (ex Tard.). **S.L.:** Don (BM); Kichom, Great Scarcies R. T. S. Jones F. 35 (BM), Jordan 389 (K); Sherbro Isl. Hunter 10 (BM); Waterloo Deighton 2063 (K). **Lib.:** Grand Bassa Dinklage 1708 (BM); Monrovia Harley 117 (K), Baldwin 11043 (K). **Iv.C.:** Grand Bassam to Azuretti Abbayes 382 (BM). **Ghana:** Pra R. Johnson 996 (K); Sekondi Chipp 216 (BM, K); mouth of Ancobra R., Axim Irvine 2131 (K); Apowosiko, Axim Cudjoe 49 (K); Nhwini R., Takoradi Box 2076 (BM). **S.Nig.:** Ikoyi, Lagos Jones FHI 19408 (BM); Lagos Dalz. 1291 (K); R. Niger Barter (BM); R. Nun T. Vogel (K); Calabar Fraser 27 (BM), Richards 3987 (K), Robb (BM). **Br.Cam.:** Victoria Kalbreyer 226 (BM), Hilland 146 (K); Tiko Maitland 976a (K.). **F.Po:** T. Vogel 136 (K), Mann 147 (K).

Tropical saline mudflats generally.

Dr. C. D. Adams reports the plant from Agona–Mankrong which is an inland locality 25 miles from the coast. The W. African plants are larger with less truncate leaflets than most Asiatic specimens, but resemble those from the West Indies.

2. *CERATOPTERIS* Brongn. — Sim F.S.A. 294 (1915); Copel. Gen. 83 (1947).

Aquatic marsh plants; caudex short, erect, with a few scattered scales; stipes green, fleshy with numerous vascular bundles; fronds dimorphous; sterile fronds with broad, lobes, ovate or triangular, pinnate or bipinnatifid, often viviparous; venation closely reticulate without included free veinlets; fertile fronds dissected with marginal sori of scattered sporangia, and an inflexed margin; sporangia short-stalked, with an obsolescent annulus; spores trilete, ribbed, with elongate meshes.

*Ceratopteris cornuta* (P. Beauv.) Lepr. in Ann. Sci. Nat., sér. 1, 19 : 103, t. 4A (1830); Bened. in Bull. Torr. Bot. Club 36 : 463 (1909); Tard. Mém. I.F.A.N. 28 : 31, t. 2, fig. 3 (1953).

Roux 2009: Synonym of *Ceratopteris thalictroides* (L.) Brongn.

*Pteris cornuta* P. Beauv. Fl. Oware 1: 63, t. 37, fig. 2,38 (1809).

*Ceratopteris gaudichaudii* of Brunner Reise Senegamb. 127 (1838).

*Ceratopteris thalictroides* of Hook. Syn. Fil. 174 (1867), partly; Chev. Bot. 775; Sim F.S.A. 294, t.109, fig. 3 (1915); Engl. Pflanzenw. Afr. 2 : 60 fig. 58 (1908); not of Brongn.

In shallow water in lakes and streams and brackish water, floating or rooting in mud; up to 1,500 ft. alt.

**Sen.:** Brunner 55 (BM), Perrottet (BM); R. Casamance Perrottet (BM, K); Limnutt Brunner 75 (K); Gheda, Cape Verde Leprieur (K); Sampsar Roger (K). **Fr.G.:** Kaba to Tonfili Chev. 20394 (Chev.). **Fr.Sud.:** Tanfola Chev. 644 (K). **S.L.:** Njala Deighton 2560 (K, NJ); Layah Sc. Elliot 4648 (K); Mamaka Thomas 4616 (K); Maswari Deighton 4689 (BM, K, NJ); Rokupr, Magbema Jordan 771 (BM, NJ). **Lib.:** Gbeidin Harley F. 206 (BM), F. 211 (BM); Gbanga Linder 545 (K); Bolahun Earthy 38 (BM); Zwedru Baldwin 7046 (K); Wohmen Baldwin 10081 (K); Suacoco, Gbanga Traub 259 (BM). **Iv.C.:** crater lake, Mt. Crombo–Noka Abbayes 427 (BM); Makaoué, Agnéby Chev. 17057 (ex Chev.). **Ghana:** Asuansi Box 2044 (BM); Oda Box 2932 (BM). **Dah.:** Sakéte to Pedjilé, Porto Novo Chev. 22903 (ex Chev.). **N.Nig.:** R. Niger Barter (BM); Nupe Barter 1447 (K); Ibi Judd (K); Anara F.R. Zaria Prov. Olorunfemi FHI 24425 (K); Kontagora Dalz. 244 (K). **S.Nig.:** Ibadan Jones FHI 14827 (BM); Elugu, Omo (formerly part of Shasha) F.R. Ross 64 (BM); Warri (ex Beauv.); Okomu F. R. Richards 3654 (BM).

Widespread in tropical Africa. (Fig. 9.)



Fig. 9.—*Ceratopteris cornuta* (P. Beauv.) Lepr. (Adiantaceae).

A, habit, c. 1/2. B, sterile frond, x 1. C, sorus, X 10. D, sporangium, X 42. E, portion of pinnule with sporangia partially covered by margin of frond, x 6.

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*CONIOGRAMME* Fée — Copel. Gen. 63 (1947)..

Terrestrial ferns with creeping rhizomes; scales entire, neither peltate nor clathrate; stipes with U-shaped vascular strands; fronds bipinnate with large lanceolate pinnules; veins once or twice forked, free, terminated by hydathodes; sori continuous along the veins, exindusiate; paraphyses present.

*Coniogramme africana* Hieron. in Hedwigia 57 : 293 (1916); Tard. in Mém. I.F.A.N. 28 : 206, t. 9, fig. 5, 6 (1953).

Roux 2009: Accepted name

*Gymnogramme javanica* of Hook. Syn. Fil. 381 (1868), partly, not of Bl.

*Coniogramme fraxinea* of Engl. Pflanzenw. Afr. 2 : 36, fig. 30 (1908).

Terrestrial, by rocky streams in forest; 800 to 4,300 ft. alt.

**S.Nig.:** R. Ata, below Mt. Koloishe, Obudu Div. Savory & Keay FHI 25044 (BM). **Br.Cam.:** Etam Rosevear (BM); Cam. Mt. Johnston 127 (BM), Mann 1365 (K), 2054 (K); below Liwonge Richards 4253 (BM, K); Buea Preuss 606a (ex Hieron.), Deistel 441 (ex Hieron.), Migeod 226 (K). **F.Po:** Mann (BM, K), 664 (K); Moka Adams 1044 (BM); Ilache Falls Adams 1077 (BM, K).

Also in S. Tomé and eastwards to Kenya.

There is some variation in the serration of the pinnules but this does not seem to be a specific distinction.

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4. *PITYROGRAMMA* Link — Copel. Gen. 75 (1947). Ceropteris Link; Sim F.S.A. 196 (1915).

Terrestrial ferns with a short erect caudex; scales entire not peltate; stipes dark-coloured, without pale lateral lines, with 2 vascular strands; fronds 2–3 pinnate; venation free, lower surface of leaflets covered with a white (in W. African species) mealy substance, composed of rod-shaped resinous bodies, secreted by and covering the club-shaped apical cells of the hairs.

*Pityrogramma calomelanos* (Linn.) Link Handb. Erkenn. Gewächs. 3 : 20 (1833); Tard. in Mém. I.F.A.N. 28: 206 (1953).

Roux 2009: Accepted name

*Acrostichum calomelanos* Linn. Sp. Pl. 2: 1072 (1753).

*Gymnogramma calomelanos* (Linn.) Kaulf. Enum. FIL. 76 (1824); Hook. Gard. Ferns t. 50 (1862); Syn. Fil. 385 (1868).

*Ceropteris calomelanos* (Linn.) Underw. Bull. Torr. Bot. Cl. 29: 632 (1902); Sim F.S.A. 196, t. 88 (1915).

*Pityrogramma insularis* Domin in Publ. Fac. Sci. Charles Univ. 88 : 6 (1928).



On bare earth in roadside cuttings, or cleared ground, up to 4,400 ft. alt.

**Fr.G.:** (ex Tard.). **S.L.:** Newton Farm T. S. Jones 344 (BM); Njala Deighton 3366 (K); Hill Station Deighton 236 (K); Freetown Brunn 1 (BM), 2 (BM); Wellington T. S. Jones 351 (BM). **Lib.:** Ganta Harley 46 (K). **Iv.C.:** Adiopodoumé N. of Abidjan Abbayes 155 (BM). **Ghana:** Takoradi Fraser 8 (BM), 9 (BM), 10 (BM); Obuasi Andoh FH 4215 (K); Asuansi Box 2054 (BM), 2875 (BM); Dunkwa Box 2061 (BM); Tarkwa Vigne FH 4119 (K); Ancobra R., Axim Irvine 2142 (K). **S.Nig.:** Ibadan Latilo FHI 22736 (K), Meikle 997 (K), 1162 (K); Nanka, Awka Div. Keay FHI 21526 (BM). **Br.Cam.:** 1922 lava flow, Debunscha Rosevear 40/37 (BM); Buea Fraser 33 (BM), 34 (BM); Victoria Wolff 28 (BM); Litoka, Cam. Mt. Maitland 1090 (K). **F.Po:** Musola Guinea 1314 (BM).

A native of tropical America now introduced in most of the warmer parts of the Old World; a common weed in W. Africa.

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5. *ADIANTUM* Linn. — Sim F.S.A. 239 (1915); Copel. Gen. 78 (1947).

- 1 Fronds once pinnate: 2  
Fronds 2–4 pinnate: ----- 6
- 2 Rhachis and petioles winged, glabrous *1. soboliferum*  
Rhachis and petioles not winged: ----- 3
- 3 Rhachis glabrous: 4  
Rhachis more or less pubescent: ----- 5
- 4 Pinnules about twice as long as broad *2. philippense*  
Pinnules 3 — 4 times as long as broad ----- *3. schweinfurthii*
- 5 Sterile pinnules acutely toothed with veins ending in teeth, not impressed above  
*4. confine*  
Sterile pinnules crenate, veins not ending in teeth, impressed above ----- *5. incisum*
- 6 Fronds pedate; sori strongly curved; leaf–margins sinuate *6. oatesii*  
Fronds not pedate: ----- 7
- 7 Fronds regularly bipinnate; sori straight; leaf–margins acutely toothed *7. vogelii*  
Fronds tripinnate: ----- 8
- 8 Sori curved; pinnules breaking off at base, leaving persistent stalks 8.  
*poiretii*  
Sori straight; pinnules persistent ----- *9. capillus–veneris*

1. *Adiantum soboliferum* Wall. ex Hook. Spec. Fil. 2 : 13, t. 74A (1851); Syn. Fil. 115 (1867); Tard. in Mém. I.F.A.N. 28 : 94, t.15, fig. 1, 2 (1953).

Roux 2009: Accepted name

*Adiantum mettenii* Kuhn Fil. Afr. 65 (1868), name only; Bak. Syn. Fil. 472 (1874); Kuhn in Jahrb. K. Bot. Gard. Berl. 1: 338(1881).

*Adiantum alatum* Peter in Fedde Rep. Beih. 40: 43 (1929).

*Adiantum lunulatum* of Ogata Ic. Fil. Jap. 2: t. 53 (1929), not of Burm. f.

Among rocks in forest; below 1,000 ft. alt.

**Ghana:** L. Bosumtwi, N. Scarp Box 2900 (BM), Adams 540 (K).  
Widespread in tropical Africa and Asia.

2. *Adiantum philippense* Linn. Sp. Pl. 2: 1094 (1753); Tard. l.c. 94 (1953).

Roux 2009: Synonym of *Adiantum lunulatum* Burm.f.

*Adiantum lunulatum* Burm. f. FL. Ind. 235 (1768); Hook. Syn. Fil. 114 (1867), partly; Kuhn Fil. Afr. 65 (1868); Engl. Pflanzenw. Afr. 2 : 43, fig. 35 A & B (1908); Sim F.S.A. 243, t. 119 (1915); Bonap. Notes Ptérid. 1 : 87 (1915); 7 : 211, 218 (1918); Ogata l.c. 5: t. 204 (1933).

Weed in cultivated ground and on walls, sometimes on rocks, in damp shaded spots; up to 4,000 ft. alt.

**Fr.Sud.:** Koulikoro Chev. 2918 (ex Tard.). **Port. G.:** Cubisseco Esp. Santo 2168 (LISC). **Fr.G.:** Mamou, Fouta Djallon Abbayes 642 (BM); Tamara, Los Isl. Mugnies–Serand (K); Dafola Pobéguin 1056 (K). **S.L.:** Sugar Loaf Mt. Welwitsch 5 (BM), T. S. Jones 332 (BM, NJ); Freetown Johnston (BM, K), Deighton 2023 (BM, NJ); Gberia Fotomba Small 420 (K, NJ); Mayolo, Makump Deighton 1365 (K, NJ); NJala Deighton 3791 (K, NJ). **Lib.:** Bilimu Harley F. 174 (BM); Kassa Linder 831 (K). **Iv.C.:** Gagoué to Sonconvala Chev. 21579 (ex Tard.); Ouadé to Gtoureini Chev. 21631 (ex Tard.); Négouéni, Bobo–Dloullasso Ravisé 9 (ex Bonap.). **Ghana:** Mampong Scarp Adams & Akpabla GC 4533 (BM). **Togo:** Kersting A. 126 (BM); Kué Mts. Kersting A. 652 (BM); Amedzofe Irvine 3376 (K); Akpafu Scholes 35 (BM). **Dah.:** Atacora Mt. Chev. 21, 103, 24187 (ex Tard.); Firou Chev. 24325 (ex Tard.). **Fr.Nig.:** Gourma Chev. 24312 (ex Tard.). **N.Nig.:** Zungeru Dalz. 243 (K); Nupe Barter 1441 (K); Jos Plateau Lely P. 295 (K); Naraguta Lely 304 (K); Sukur, Mandara Mts. Royer 146 (BM); Kurmin Ninte, Jemaa Div. Keay FHI 21049 (BM); Patti Lokoja Elliott 7 (K); S. of Kabba Sc. Elliott 71 (K). **S.Nig.:** Boje, Ikom Jones & Onochie FHI 18759 (BM); Obeyon Holland 219 (K); Idanre Brenan 3850 (BM). **Br.Cam.:** Victoria Kalbreyer 233 (BM); L. Barombi Box 3601 (BM), Richards 4066 (BM); Victoria–Kumba Road Richards 4066 (BM); Johann–Albrechtshöhe Staudt 451 (K); Wum L., Bamenda Savory UCI 384 (BM).

Widespread in the tropics of the Old World.

3. *Adiantum schweinfurthii* Kuhn in Sitzungsber. Ges. Nat. Fr. Berl. 1869: 40; in Bot. Zeit. 1870 : 89; Bak. Syn. Fil. 472 (1874); Tard. l.c. 97, t. 15, fig. 10 (1953).

Roux 2009: Accepted name

*Adiantum chevalieri* Christ in Bull. Soc. Bot. Fr. 55, Mém. 8 : 105 (1908).

Sides of gullies in shade; up to 4,000 ft. alt.

**Fr.Sud.:** Tabacco Chev. 2917 (K, P). **Fr.G.:** Kouroussa Pobéguin 1053 (K); E. of Mamou Nikles 35 (ex Tard.). **Togo:** Kué Mts. Kersting A. 651 (BM, K). **N.Nig.:** Kentish–Rankin (K); Gerti Kloof, Kafanchan Jones FHI 18805 (BM); Sukur Royer 145 (BM); Anara F.R. Zaria Keay FHI 22996 (BM, K); S. of Kabba Elliott 72 (K); Zungeru Dalz. 242 (K).

Also in the Sudan and Ubangi.

4. *Adiantum confine* Fée Mém. Fam. Foug. 10: 14, t. 32, Fig. 1 (1865); C.Chr. in Dansk. Bot. Ark. 7: 124 (1932); Tard. l.c. 96, t. 15, fig. 3 (1953).

Roux 2009: Accepted name

On ground in shade in forest; below 1,000 ft. alt.

**Iv.C.:** Sinfra Abbayes 174 (BM); Kouin Forest, Man Abbayes 2179 (BM). **Ghana:** Nkwantanang, Abetifi Scholes 134 (BM); Volta River F.R. Odumasi Adams 369 (BM). **Togo:** Akpafu Scholes 35b (ex Adams).

Also in Tanganyika, Comoro Islands and Madagascar.

5. *Adiantum incisum* Forsk. Fl. Aegypt.–Arab. 187 (1775).

Roux 2009: Accepted name

*Adiantum capillusgorgonis* Webb in Hook. Niger Fl. 192 (1849).

*Adiantum zollingeri* of Carruth. in Cat. Welw. 2 : 266 (1899), not of Mett.

*Adiantum caudatum* of Hook. Syn. Fil. 115 (1867), partly. Sim F.S.A. 241, t. 118, fig. 2 (1915); Ogata l.c. 2: t. 51 (1929); Tard. l.c. 96, t. 15, fig. 4, 5 (1953).

Weed in roadside ditches, etc.

**Ghana:** Bame Pass Adams & Akpabla GC 4001 (BM, K); Shai Hills Adams 520/52 (BM). **Togo:** Kpandu Asamany 145 (K). **N.Nig.:** Jebba Barter 1450 (K).

Widespread in tropical Africa and Asia.

[The typical *A. caudatum* Linn from Ceylon has usually longer petioles, more oblong deflexed pinnae with narrower sinuses, densely pubescent on the upper surface and with less impressed veins. Plants from Ceylon have been found to be triploid and apogamous, those from Malaya tetraploid.]

6. *Adiantum oatesii* Bak. in Oates Matabeleland App. 5 & fig. (1881); Sim F.S.A. 244, t. 120 (1915).

Roux 2009: Synonym of *Adiantum patens* Willd. subsp. *oatesii* (Baker) Schelpe

*Adiantum patens* var. *oatesii* (Bak.) Ballard in Kew Bull. 1937: 31.

Rocky places, in shade, 2,500 ft. alt.

**N.Nig.:** Neill's Valley, Jos Keay FHI 20069 (BM); Jos Plateau Lamb (K), Lely P. 543 (K). **S.Nig.:** Aba, Abagana Kitson (BM). **Br.Cam.:** Bamenda to Wum Morton K. 298 (GC).

Also in eastern Africa from the Sudan to N. Rhodesia.

7. *Adiantum vogelii* Mett. ex Keys, in Mém. Acad. Petersb. sér. 7, 22, 2 : 8, 31 (1875); Tard. l.c. 97, t. 15, fig. 6 (1953).

Roux 2009: Accepted name

*Adiantum tetraphyllum* var. *obtusum* Mett. ex Kuhn Fil. Afr. 66 (1868); Bonap. Notes Ptérid. 1 : 81, 97 (1915).

*Adiantum tetraphyllum* var. *vogelii* (Mett.) Bonap. l.c. 105 (1915); Schnell & Tard. in Rev. Gen. Bot. 55 : 19 (1947).

*Adiantum tetraphyllum* of Hook. Syn. Fil. 120(1867), partly; Engl. Pflanzenw. Afr. 2 :

44, fig. 36 (1908), not of Willd.

Forests, usually secondary, in shade, especially on banks of rivers and as a weed in cocoa plantations; up to 1,200 ft. alt.

**Fr.G.:** (ex Tard.). **S.L.:** Gene Deighton 337 (BM, K, NJ); Bagbe, Gola Forest Small 705 (K); Layah Sc. Elliot 4748 (K). **Lib.:** R. Mano, below Jui Bunting (BM); Ganta Harley F. 38 (K). **Iv.C.:** Adiopodoumé, Abidjan Abbayes 231 (BM); Tinahou Schnell 1273 (ex Schnell & Tard.); Bans Massif Schnell 1328 (ex Schnell & Tard.); Nimba Mts. Schnell 1407 (ex Schnell & Tard.); Agnéby to Bia Rousseau & Cervoni (ex Bonap.); Bassam Hostains (K). **Ghana:** Neon F.R. Cudjoe 23 (K); Kumisi Cummins 85 (K); Asians Box 2031 (BM); Ode Box 2483 (BM); Kukurantomi Adams 251 (BM); Mampong Box 2090 (BM); L. Bosumtwi Box 2897 (BM); Amentia Irvine 462 (K). **Togo:** Buén Mischlich (BM). **Dah.:** Adja Ouéré Le Testu 37 (ex Bonap.). **N.Nig.:** Benue R. Dah. 760 (K); Otobi Kurmi, Benue Prov. A. P. D. Jones FHI 1059 (BM). **S.Nig.:** Omo (formerly part of Shasha) F.R. Ross 181 (BM), 223 (BM), Richards 3386 (BM), 3235 (BM); Isheri, Lagos Fraser 18 (BM); Mamu River F.R. Keay FHI 22297 (BM); Angiama Barter 2094 (K); Aboh Barter 1458 (K); Okomu F.R. Brenan in Hb. Richards 3958 (K); Ibadan Meikle 1147 (K). **Br.Cam.:** Victoria Kalbreyer 2 (BM); above Ntotse R., Tiko Dunlap 257 (K). **F.Po.:** Mann (BM), 141 (K), Barter (K), T. Vogel 147 (K).

Also in Principe and south to Angola and east to Zanzibar (Vaughan 2149).

8. *Adiantum poiretii* Wikstr. in Svensk. Vet. Akad. Handl. 1825 : 443 (1826); Sim F.S.A. 247, t. 123, fig. 1 (1915).

Roux 2009: Accepted name

*Adiantum thalictroides* Willd. ex Kunze in Linnaea 10 : 530 (1836).

*Adiantum aethiopicum* of Hook. Syn. Fil. 123 (1867), partly; Kuhn Fil. Afr. 62 (1868), partly, as to plate.

In montane forest; 7,000 to 9,000 ft. alt.

**Br.Cam.:** Cam. Mt. Kalbreyer 113 (BM), Mann 1367 (K), 2047 (K); Mann's Spring Steele 92(K), Richards 4210 (BM, K); Tongo Maitland 1057 (K) Hut 2, Cam. Mt. Thorold 26 (K); Mba Kokeka Mt, Bamenda Keay FHI 28408 (BM); above L. Oku, Bamenda Savory UCI 455 (BM).

Widespread In E. tropical Africa and Asia at higher levels and represented by allied species in tropical America.

9. *Adiantum capillus-veneris* Linn. Sp. Pl. 1096 (1753); Hook. Syn. Fil 123 (1867); Sim F.S.A. 245, t.122, Fig. 122 (1915); Ogata l.c. 1 : t. 1 (1928).

Roux 2009: Accepted name

Fr.Sud.: between Haut-Sénégal and R. Niger Bellamy 187 (P), 301 (P). Fr.Nig.: Guetta & Guettara, Mortcha Murat 390 (P).

Almost cosmopolitan; in N., E. and S. Africa.

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6. *PTERIS* Linn. — Sim F.S.A. 252 (1915); Copel. Gen. 60 (1947), partly.

1 Fronds bipinnatifid or pinnate, not tripartite:2

Fronds tripartite or pedate: -----15

- 2 Fronds simply pinnate (basal pinnae with 1 or 2 lobes): 3  
Fronds bipinnatifid: ----- 5
- 3 Pinnae petiolulate; fronds decrescent; rhizome creeping, with pale brown scales  
*1. vittata*  
Pinnae sessile, up to 12 each side; fronds not decrescent; rhizome erect, with bright brown scales: ----- 4
- 4 Pinnae sometimes adnate, never decurrent, with entire sterile tips; veins all free,  
close, parallel; gemmae present or not *2. camerooniana*  
Pinnae decurrent, with serrulate sterile tips; veins reticulate; gemmae present ----- *12. burtoni*
- 5 Sterile tips of fertile segments entire: 6  
Sterile tip of segment toothed or crenate: ----- 10
- 6 Fronds with gemmae; veins all free; spines present on upper surface of midribs  
of segments: 7  
Fronds without gemmae: ----- 8
- 7 Pinnae not lobed to the Costa; lobes about 5 mm. broad; veins 1–2–forked; stipes  
straw–coloured; frond ovate–lanceolate *3. prolifera*  
Pinnae lobed to the costa; lobes about 3 mm. broad; veins 1–forked; stem with a castaneous line on the lower  
surface; fronds narrowly oblong ----- *4. preussii*
- 8 Veins all free; stipes reddish *5. togoensis*  
Veins united below each sinus to form one row of costal areoles: ----- 9
- 9 Apices of segments rounded; stipes straw–yellow; united veins forming a  
triangle *6. linearis*  
Apices of segments acute; stipes brown; united veins parallel to costa forming a narrow areole *7. barombiensis*
- 10 Veins all free; sterile pinnae regularly toothed *8. dentata*  
Veins not all free; sterile pinnae entire or toothed at apex only: ----- 11
- 11 Veins of lobes free, united below the sinuses: 12  
Veins of lobes more or less united: ----- 13
- 12 Costa spinose; stipes straw–coloured, smooth; pinnae 3–4 pairs *9. acanthoneura*  
Costa not spinose; stipes usually castaneous, sparingly spinose at base; pinnae 2–3 pairs ----- *10. mildbraedii*
- 13 Fronds not scandent, with up to 7 pairs of pinnae; rhizome short, creeping; stipes  
not spiny, usually castaneous: 14  
Fronds scandent with up to 28 pairs of pinnae, 1–2 m. long; segments acuminate; paraphyses wanting; bulbils  
usually 2 or more; rhizome erect; stipes straw–coloured or castaneous, spiny or not ----- *13. similis*
- 14 Paraphyses present; gemmae wanting; costae more or less spinulose; fronds  
regularly bipinnatifid; venation usually prominent *11. atrovirens*  
Paraphyses wanting; gemmae present; costae rarely spinulose; fronds polymorphic, pinnate to bipinnatifid;  
venation usually less prominent ----- *12. burtoni*
- 15 Stipes not spiny, pale brown or stramineous: 16  
Stipes armed with strong spines, castaneous; segments not cut to the rhachis; veins all free ----- *16. intricata*
- 16 Segments cut to the rhachis; veins all free; fronds tripartite, up to 1.2 m. long  
*14. pteridioides*  
Segments not cut to the rhachis; veins united below the sinuses to form a single row of areoles; fronds pedately  
branched, up to 2 m. long ----- *15. marginata*

1. *Pteris vittata* Linn. Sp. Pl. 2 : 1074 (1753); Hieron. In Hedwigia 54 : 290 (1914); Tard. In Item. I.F.A.N. 28 : 69, t. 10, fig. 1 (1953).

Roux 2009: Accepted name

*Pteris longifolia* of Ogata Ic. Fil. Jap. 3 : t. 146 (1980), not of Linn.

**Ghana:** Obuasi Adams GC 4562 (BM).

Old World tropics generally, Cape Verde Is., Canaries; introduced in Argentina, Trinidad and Antigua.

2. *Pteris camerooniana* Kuhn Fil. Afr. 207 (1867); Tard. l.c. 70, t. 10, fig. 3, 4 (1958).

Roux 2009: Accepted name

*Pteris manniana* Mett. Ex Kuhn Fil. Afr. 84 (1887).

*Pteris jungneri* Brause & Hieron. in Engl. Bot. Jahrb. 83 : 388 (1915).

*Pteris pellucida* of Hook. Syn. ML 154 (1867), partly, not of Presl.

On ground in forest; up to 3,000 ft. alt.

**Br.Cam.:** Sowi, Bibundi Jungner 49 (B); Bibindi Plantation Winkler 1105 (P); Cam. Mt. Mann 1385 (K), Kalbreyer 24 (B), Johnston 145 (BM, K); Johann–Albrechtshöhe Staudt 464 (BM, K); Kumba Brenan 4067 (BM, K). **F.Po.:** Mann (BM), 126 (K), Barter (K); Loretto L., Moka Adams 1016 (BM), 2894 (K); Monte Balea Jumea 417 (BM), 349 (BM).

3. *Pteris prolifera* Hieron. in Engl. Bot. Jahrb. 53 : 397 (1915); Tard. l.c. 72, t. 11, fig. 1, 2 (1953).

Roux 2009: Synonym of *Pteris preussii* Hieron.

Near paths In forest; 3,800–4,100 ft. alt.

**Br.Cam.:** Cam. Mt. Adams GC 4100 (BM). **F.Po.:** Mann (BM); near Ilache waterfall Adams 1066 (BM); Moka to Ilache Adams 1059 (BM); Balaiha Guinea 1499 (BM).

Also south to Angola.

4. *Pteris preussii* Hieron. L.c. 399 (1915). ? *P. quadriaurita* of Tard. l.c. 76, t. 12, fig. 3 (1953), partly.

Roux 2009: Synonym of *Pteris preussii* Hieron.

On rocks in forest; 2,500–4,500 ft. alt.

**Br.Cam.:** W. of Buea Preuss 585 (BM); Victoria Kalbreyer 149 (BM); above Buea Annet 76 (P), 50 (P).

5. *Pteris togoensis* Hieron. In Engl. Bot. Jahrb. 53 : 402 (1915).

Roux 2009: Accepted name

*Pteris kamerunensis* Hieron. l.c. p. 393.

*Pteris quadriaurita* of Hook. Syn. Fil. 158 (1867), partly, not of Retz.; Tard. l.c. 76

(1953), partly.

*Pteris biauroides* of Sim F.S.A. 257, t.127 (1915), not of Linn.

On rocks and ground on margin of forest; 1,000 to 7,000 ft. alt.

**Fr.Sud.:** Sarakourouba Chev. 483 (K, P). **Fr.G.:** Heudelot 703 (K); Fouta Djallon Pobéguin 2221 (K); Pita Pobéguin (K). **S.L.:** Don (BM); York Pass T. S. Jones 319 (BM, NJ); Musaia Deighton 5391 (K, N J); Bintumane T. S. Jones 2 (BM, N.T), 3 (BM, NJ), Jaeger 295 (K); Loma Mts. Jaeger 295 (HJ); Wallia Sc. Elliot 47476 (K); Mahnoo Mair (K). **Lib.:** Bilimu Harley 84 (K); Ganta Harley 41 (K). : Mt. Orombo–Boka Abbayes 402 (BM). **Ghana:** Aburi Box 2879 (BM); Akropong Irvine 2614 (K); Akrum waterfall, Begoro Box 2947 (BM); Bekwai Box 2895 (BM); Asuansi Box 2056 (BM); Bompata Vigne FH 2710 (K); Mampong, Ashanti Vigne FH 4101 (K). **Togo:** Amedzofe Scholes 66 (BM). **N.Nig.:** Patti Lokoja Elliott 32 (K). **S.Nig.:** Lagos Phillips 20 (K); Oni Gambari, Ibadan Tamajong FHI 23275 (BM); Omo (formerly part of Shasha) F.R. Ross 51 (BM); Agulu Thomas 224 (K); Port Harcourt Wolff 22 (BM). **Br.Cam.:** Cam. Mt. Johnston 126 (BM), Maitland 1049 (K), Mann 1368 (K), 2050 (K); Mann's Spring Kalbreyer 134 (BM), Richards 4211 (BM); above Buea Migeod 220 (BM), Adams 1224 (BM); Bamenda Migeod 384 (BM, K). **F.Po:** T. Vogel 70 (K), Barter (K), Mann (K).

[There are probably two or more species included under this name. Further work on the segregates of *P. quadriaurita* is required.]

6. *Pteris linearis* Pair, in Lam. Encycl. Méth. Bot. 5 : 723 (1804); Ching in Lingnan Sci. Journ. 12 : 588, t. 43 (1933). *P. biauroides* of Hook. Syn. Fil. 165 (1867), partly, not of Linn.; Tard. l.c. 77, t. 12, fig. 6 (1953).

Roux 2009: Accepted name

*Pteris nemoralis* Willd. Enum, Pl. Hort. Berl. 1073 (1899), partly.

*Pteris hildebrandtii* of Tard. l.c. 74, t. 12, fig. 2 (1953).

Up to 7,000 ft. alt.

**Fr.G.:** Macenta, Adam 3051 (P). **S.L.:** Don (BM, K), Morton (K); Wallia Sc. Elliott 4567 (BM), 4569 (K); Signal Hill Johnston (BM), 42 (K); Freetown Welwitsch 7 (BM, K), Barter (K); Waterloo Kirk (K). **Iv.C.:** N. of Bassam Hostains; Morénou Chev. 22506 (F). **Ghana:** Boti, Huhunya Adams 280 (BM, K). **Br.Cam.:** Cam. Mt. Dunlap 219 (K). **F.Po:** T. Vogel 182 (K).

Also from the Sudan (Jackson 1197) to S. Africa (Schütte 58) and Mascarenes.

7. *Pteris barombiensis* Hieron. in Engl. Bot. Jahrb. 53 : 413 (1915); Tard. l.c. 77 (1953).

Roux 2009: Accepted name

In forest.

**Br.Cam.:** S.W. of Barombi Station Preuss 357 (BM).

Also in French Cameroons (Zenker 1461).

8. *Pteris dentata* Forsk. Fl. Aegypt–Arab. 186 (1775); Sim F.S.A. 255, t. 129 (1915).

Roux 2009: Accepted name

*Pteris flabellata* Thunb. Prod. Fl. Cap. 172 (1800); Hook. Syn. Fil. 161 (1867).



*Pteris arguta* var. *flabellata* (Thunb.) Mett. (1868); Engl. Pflanzenw. Afr. 2 : 43, Fig. 38 C–E (1908).

In open woods, at about 4,000 ft. alt.

**F.Po:** Mann (BM, K), 382 (K); Moka Exell 839 (BM), Adams 1048 (BM); St. Isabel Peak Guinea 2959 (BM), 2960 (K).

Also in East and South Africa, the Mascarene Islands and Arabia.

9. *Pteris acanthoneura* Alston in Contrib. Fl. Moçamb. 2 : 15, t. 4, 5 (1964); Tard. l.c. 78, t. 40, Fig. 6 (1953).

Roux 2009: Synonym of *Pteris hamulosa* (H.Christ) H.Christ

*Pteris biaurita* var. *africana* Bonap. forma *spinulifera* Bonap. Notes Ptérid. 1: 105 (1915), name only.

On ground in forest; at low elevations.

**Iv.C.:** Dunbokrou Hostains (K. P); Basso Serv. For. 2902 (P); Basso F.R. Agboville Portères 2306 (P). **Ghana:** Thonning (C); Dodowa Adams (BM); Amanase to Okroase Adams 383 (K); Kumasi Cummins 83 (K); Afwerase Hills, Aburi Darko 5 (K); Amentia Irvine 507 (K). **N.Nig.:** Otobi Kurmi, Benue Prov. Jones FHI 1060 (BM). **S.Nig.:** Akure F.R. Jones FHI 19525 (BM).

Also in Uganda (Wood 536), E. Sudan (Andrews 1443), Ubangi (Le Testu 2534) and Belgian Congo (Lebrun 785).

10. *Pteris mildbraedii* Hieron. in Engl. Bot. Jahrb. 53 : 415 (1915); Tard. l.c. 77, t. 12, fig. 4, 5 (1953).

Roux 2009: Accepted name

By streams or in swamp forest; at low elevations.

**Ghana:** near Basakeh, Axim Cudjoe 59 (BM). **Dah.:** Sakété, Porto Novo Chev. 23876 (K). **S.Nig.:** Omo (formerly part of Shasha) F.R. Richards 3238 (BM), Ross 28 (BM); Abeku Jones & Onochie FHI 16663 (BM); Ajagbodudu Wright 25 (K); Onitsha Barter 1460 (K); Agulu Thomas 197 (K); Oban Talbot (BM, K), Richards 5197 (BM). **F.Po:** Monte Balea Guinea 535 (BM).

Also south to Belgian Congo (Jensen 60) and Spanish Guinea (Guinea 1015).

11. *Pteris atrovirens* Willd. Sp. Pl. 5 : 385 (1810); Bak. Syn. Fil. 170 (1874); Tard. in Mém. I.F.A.N. 28 : 79, t. 11, fig. 8 (1953).

Roux 2009: Accepted name

*Pteris spinulifera* Schum. in Vid. Selsk. Afh. 4 : 233 (1829); Hook. Syn. Fil. 170 (1867).

In forest in shady places including Cacao plantations.

**Fr.G.:** Macenta Portères 2602 (P). **S.L.:** Taiama, Kori Cole 47 (BM, NJ); Freetown Deighton 2047 (K); Wallia Sc. Elliot 4747a (BM, K); Mahnoo Mair (K). **Lib.:** Ganta Harley 1919 (BM); Cape Palmas Ansell (K). **Iv.C.:** Adiopodoumé Abbayes 179 (BM). **Ghana:** Akwapim Thonning (C); Asuansi Boti 2034 (BM), 2034a (BM); Dodowa Adams (BM); Aburi Adams (BM); S. Scarp F.R. Moor FH 2109 (K);



Jimira F.R. Vigne FH 3052 (K). **Togo:** Buén Mischlich (BM); Kpandu Asamany 167(K). **S.Nig.:** Warri & Benin Beauvois 119 in Bb. Willd. 1995 (B); Omo F.R. (formerly part of Shasha) F.R. Jones & Onochie FHI 17507 (BM), Richards 3387 (BM); Isheri, Ogun R. Fraser 20 (BM); Okomu F.R. Richards 3945 (K); Aboh Barter 283 (K); Old Calabar Robb (BM). **F.Po:** Mann (BM), Guinea 697 (BM), Barter 1464 (K).

Also in **Principe**, **S. Tomé** and in other parts of tropical Africa.

12. *Pteris burtoni* **Bak.** in Ann. Bot. 5 : 218 (1891); Tard. l.c. 72, t. 10, Fig. 6, 7 (1953).

Roux 2009: Synonym of *Pteris burtonii* Baker

*Pteris Johnston* **Bak.** l.c. (1891).

*Pteris atrovirens* **var. cervonii** **Bonap.** in Bull. Mus. Hist. Nat. 19: 388 (1913), name only.

By streams in **forest**, also in Cacao plantations.

**Fr.G.:** (ex Tard.). **S.L.:** Don (BM); Yawe Ferry, Pujehun T. S. Jones 370 (K, NJ); Njala Deighton 2096 (NJ); Mofari Sc. Elliot 4643 (BM, K); Wilberforce Johnston 95 (K); Bagroo R. Mann (K). **Lib.:** Firestone Plantation Harley 1916 (BM); Ganta Harley 23 (K). **Iv.C.:** Mafue, Assinie Chaper (P); Boaroukrou Chev. 16752 (P); Adlqpodoumé Roberty 12008 (K); Agneby to Bia Rousseau (K); region des Lagnnes Cervoni (K). **Ghana:** Burton (K); Keung F.R. Agona, Tarkwa Cudjoe 28 (BM, K); Foso–Juaso F.R. Box 2067(BM); Asuansi Box 2050 a & b (BM); S. Scarp F.R. Moor (K); Konongo Akpabla 259 (K). **S.Nig.:** Abeku Jones & Onochie FHI 17170 (BM); Omo (formerly part of Shasha) F.R. Richards 3180 (BM); Okomu F.R. Richards 3862 (K), 3957 (K). **F.Po:** Burton (K).

Also south to Angola. (Fig. 10.)

13. *Pteris similis* **Kuhn** in Deck. Reisen Ost–Afr. 3, 3, Bot. 21 (1879).

Roux 2009: Accepted name

*Pteris spinulifera* of Tard. l.c. 78, t. 11, Fig. 7 (1953).

In marshes and in **fringing forest**, especially near streams.

**Fr.G.:** Boussou, Nzérékoré Adam 3266 (P). **S.L.:** Thomas 8872 (K); Makomba, Kumike Sanda Deighton 4068 (NJ); Baiima, Jaluahun Deighton 3952 (BM, NJ); Mano Deighton 4024 (BM, NJ). **Lib.:** Bilipia Harley 218 (BM); Sakimpa, Sanokwele Harley 119 (K). **Iv.C.:** Guidéko Chev. 16367 (P). **Ghana:** Pra–Anum F.R. Box 2925 (BM); Akwapim Johnson 203 (K); Bobiri F.R. Adams 555 (K). **Togo:** Amedzofe Scholes 65 (BM). **Dah.:** Pedjilé to Pobé Chev. 23103 bis (P). **S.Nig.:** Lagos Moloney (K); Abeku Jones & Onochie FHI 17167 (BM, K); Omo (formerly part of Shasha) F.R. Richards 3236 (BM); Okomu F.R. Richards 66 (BM); between Oshun and Shasha Rivers, Ijebu Richards 5094 (BM); Aboh Barter 88 (K); Qua Spring Henderson (K). **Br.Cam.:** Ambas Bay Mann 786 (K). **F.Po:** Mann (BM).

Extends to the Sudan, Uganda (Dümmar 653) and south to Angola.

14. *Pteris pteridioides* (**Hook.**) **Ballard** in Kew Bull. 1937: 348; Tard. l.c. 80, t. 11, Fig. 3, 4 (1853).

Roux 2009: Synonym of *Pteris muricella* Fée

*Hypolepsis pteridioides* **Hook.** Sec. Cent. Ferns t. 59 (1861).

*Pteris brevisora* Bak. in Hook. Syn. Fil. 162 (1867); Sim F.S.A. 268, t. 128 (1915).

Terrestrial in forest; 3,000 to 8,000 ft. alt.

**Lib.:** Bilimu Harley 83 (K), 1980 (BM, K); Bill Barker 1152 (K). **Iv.C.:** Man Schnell 4132 (P); Mt. Nimba Schnell 3494 (P). **Br.Cam.:** Cam. Mt. Johnston 125 (BM, K), Mann 1382 (K); Mann's Spring Kalbreyer 135 (BM). **F.Po:** Mann (BM); St. Isabel Peak Mann 348 (K); Finca Puente Guinea 1683 (BM); Loretto L., Moka Adams 1015 (BM, K).

Also in S. Tomé and widespread on tropical African mountains.

15. *Pteris marginata* Bory Voy. quatr. princ. îles Afr. 2 : 192 (1804); Bak. Syn. Fil. 172 (1874).

Roux 2009: Synonym of *Pteris tripartita* Sw.

*Pteris tripartita* of Hook. Syn. Fil. 172 (1867), partly, not of Sw.; Engl. Pflanzenw. Afr. 2 : 45, fig. 40 (1908); Tard. l.c. 80, t. 11, fig. 5 (1953).

In marshy places in rather open ground in forest.

**Iv.C.:** Adiopodoumé Abbayes 148 (BM). **Ghana:** S. Fomang Su F.R. Box 3459 (BM); near Kibi Boa 3507 (BM); E. Akim Johnson 860 (E); Wireso Akpabla 287 (K); Bobiri F.R. Adams 652 (K). **S.Nig.:** Aponmu, Akure F.R. Keay FHI 25539 (BM); Okomu F.R. Richards 3637 (BM, K), Ross 151 (BM); R. Niger Stanger (BM). **Br.Cam.:** Ambas Bay Mann 789 (K). **F.Po:** T. Vogel (K), Barter (K).

Tropical Africa and Mascarenes.

16. *Pteris intricata* C.B. Wright in Kew Bull. 1906 : 252. P. Adams Tard. l.c. 28 : 76, t. 12, fig. 1 (1953).

Roux 2009: Accepted name

On ground, in shade; 3,500 to 5,200 ft. alt.

**Fr.G.:** Ziama Massif Adam 4265 (P); Voroa Col Portères (F). **S.L.:** Heremafradu Plateau, Sankan Biriwa Roach (NJ, BM, E). **S.Nig.:** Ikwette, Obudu Div. Savory & Keay FHI 25188 (BM). **Br.Cam.:** Bambui to Bamenda Morton K. 168 (GC). **F.Po:** Moka to Ilache Adam 1057 (BM).

South to Angola (Carrisso & Mendonça 531) and east to Uganda,

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7. *AFROPTERIS* Alston in Bol. Soc. Brot., sér. 2A, 30 : 5 (1956).

Terrestrial fern with creeping solenostelic paleaceous rhizome; scales brown, lanceolate; fronds deltoid or pentagonal, distant, tripinnate, glabrous, herbaceous; stipes brown, shining; veins free; pinnules entire at apex; indusia elongate, introrse; paraphyses none; spores trilete.

*Afropteris repens* (C.Ch.) Alston l.c. (1956).

Roux 2009: Synonym of *Pteris repens* C.Ch.

*Pteris repens* C.Ch. Ind. Fil. 606 (1906); Tard. in Mém. I.F.A.N. 28 : 81, t. 11, Fig. 9, 10 (1963).

*P. nitida* Mett. ex Kuhn Fil. Afr. 86 (1868); Bak. Syn. Fil. 479 (1874); Engl. Pflanzenw. Afr. 2 : 44, fig. 39 (1908), not of R. Br.

**S.Nig.:** Old Calabar Robb (BM).

Also in French Cameroons and Gabon.

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8. *NOTHOLAENA* R.Br.; Sim F.S.A. 220 (1915).

Roux 2009: Synonym of *Cheilanthes* Sw.

*Cheilanthes* of Copel. Gen. 65 (1947), partly.

Terrestrial ferns, often on rocks; rhizome short–creeping, densely paleaceous, frond deltoid, coriaceous, densely woolly on the undersurface; veins free; stipes black, round and shining; sori linear, marginal, without indusium.

*Notholaena inaequalis* Kunze Farnkr. 1 : 146, t. 64, fig. 1 (1844); Hook. Syn. FJ1. 371 (1867); Sim F.S.A. 221, t. 108, fig. 2 (1915).

Roux 2009: Synonym of

*Cheilanthes inaequalis* (Kunze) Mett. Cheil. 24, t. 3, Fig. 6 (1859); Tard in Mém. I.F.A.N. 28 : 89, t. 14, Fig. 3 (1953).

On rocks in dry areas.

**Fr.G.:** Tihe Peak, Beyla Adam 501 (P); Mali Region Schnell 4810 (P); Mt. Nimba Schnell 1839 (P); Mt. Nzo Chev. 21022 (F). **N.Nig.:** Zagun, Jos Plateau Keay FHI 20080 (BM).

Also in South and East Africa.

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9. *CHEILANTHES* Sw. — Sim F.S.A. 225 (1915).

*Aleuritopteris* Fée — Copel. Gen. 67 (1947).

Terrestrial ferns, often on rocks; rhizome short, ascending, scaly; stipes black and polished; lamina deltoid, bipinnatifid, lower surface (in W. African species) covered with mealy white powder; veins free; sori marginal on the tips of the veins, with a more or less continuous false indusium; paraphyses wanting.

*Cheilanthes farinosa* (Forsk.) Kaulf. Enum. Fil. 212 (1824); Hook. Syn. Fil. 142 (1867); Sim F.S.A. 235, t. 114 (1915); Tard. in Mém .I.F.A.N. 28: 89 (1953).

Roux 2009: Synonym of *Aleuritopteris farinosa* (Forssk.) Fée

*Pteris farinosa* Forsk. Pl. Aegypt–Arab. 187 (1775).

*Aleuritopteris farinosa* (Forsk.) Fee Gen. Fil. 1.12 B, Fig. 1 (1852).

Crevices in rocks; 3,000 to 10,000 ft. alt.

**Fr.G.:** Fouta Djallon Pobéguin 14 (P); Chutes de Maleya, Sigui, Jac.–Fél. 1525 (P). **S.L.:** Loma Mts. Jaeger 309 (NJ); Bintumane T. S. Jones 6 (BM, N\T), Adam 502 (P). **N.Nig.:** Zagun, Jos Plateau Keay

FHI 20082 (BM); Naraguta Lely 305, 297 (K). **Br.Cam.:** Cam. Mt. Johnston 114 (BM), Mann 1372 (BM, K), 2064 (K), Adams 1280 (BM), Steele 13 (K); Mann's Spring Brenan 4243 (BM); Buea Preuss 793 (BM).

Widespread in tropical Africa and Asia.

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10. *DORYOPTERIS* J. Sm. — Sim F.S.A. 214 (1915); Copel. Gen. 7 (1947).

1 Sori interrupted; basal pair of pinnae united with pair above; fronds not dimorphous; sporangia stalked; spores smooth *1. kirkii*

Sori continuous; basal pair of pinnae free from pair above; fronds somewhat dimorphous; sporangia subsessile; spores spinulose ----- *2. nicklesii*

*Doryopteris kirkii* (Hook.) Alston in Bol. Soc. Brot., sér. 2A, 30 : 14 (1956).

Roux 2009: Synonym of *Doryopteris concolor* (Langsd. & Fisch.) Kuhn

*Adiantum palniatum* Schum. in K. Danske Vidensk. Selsk. 4 : 234 (1829).

*Cheilanthes kirkii* Hook. Sec. Cent. Ferns t. 81 (1861); Tard. in Mém. I.F.A.N. 28 : 88 (1953).

*Doryopteris concolor* var. *kirkii* (Hook.) Fries Wiss. Ergeb. Schwed. Rhod.-Kongo Exped. 1, 1: 4 (1941); Tryon in Contr. Gray Herb. 143 : 56 (1942).

*Doryopteris coneclor* Kuhn in Deck. Reise Ost-Afr. 3, 3, Bot. 19 (1879), exel. syn. Langsd. & Fisch.; Sim F.S.A. 214 : t. 104 (1915); Engl. Pflanzenw. Afr. 2 : 38, fig. 32 (1908).

Terrestrial, near rocks, often in rather dry secondary forest at elevations up to 3,000 ft. alt.

**Fr.G.:** Dalaba, Fouta Djallon Abbayes 742 (BM). **Iv.C:** (ex Tard.). **Ghana:** L. Bosumtwi, N. Scarp Bon 2901 (BM); Mampong Scarp, Akwapim Hills Box 2091 (BM); Akropong Irvine 2597 (K); Hew Tafo Lovi 8 (BM); Peji Hill, Anum Adams 142 (K). **N.Nig.:** Sanga River F.R. Jemaa Keay FHI 21047 (BM). **S.Nig.:** R. Awse, Ijaiye F.R., Keay FHI 21159 (BM).

Widespread in tropical Africa.

2. *Doryopteris nicklesii* Tard. in Notulae Syst. 13 : 166 (1948); in Mém. I.F.A.N. 28 : 93 (1953).

Roux 2009: Synonym of *Doryopteris concolor* (Langsd. & Fisch.) Kuhn

Roadside banks and rocky ravines, in drier parts of forest country.

**Ghana:** Mampong, Ashanti Box 2931 (BM); Bosuso Adams 463 (BM). **S.Nig.:** Idanre Hills Keay FHI 25496 (BM).

Also widespread in other parts of Africa.

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11. *PELLAEA* Link — Sim F.S.A. 197 (1915); Copel. Gen. 69 (1947).

- 1 Fronds simply pinnate; pinnae lanceolate, about 6 cm. long and 1–2 cm. wide; sporangia stalked: 2  
 Fronds tripinnate; pinnae oblong, about 6 mm. long and 3 mm. wide; veins free; sporangia sessile -----3.
- 2 Veins free; fronds glabrous 1. *doniana*  
 Veins anastomosing; fronds sparingly pubescent -----2. *schweinfurthii*  
*quadripinnata*

1. *Pellaea doniana* Hook. Sp. Fil. 2 : 137, t. 125 A (1858); Syn. Fil. 152 (1867); Sim F.S.A. 211, t. 102 (1915); Tard. in Mém. I.F.A.N. 91 (1953).

Roux 2009: Accepted name

On rocky ground, in drier parts of the forest regions and woodland; 150 to 2,000 ft. alt.

**Fr.G.:** (ex Tard.). **S.L.:** Kakoya, W. of Musala T. S. Jones 1 (BM, NJ); Kofui Sc. Elliot 4607 (K). **Lib.:** Ganta Harley 45 (K). **Iv.C.:** (ex Tard.). **Ghana:** Nsawarn to Aburi Box 2877 (BM); Akwapim Range Box 2929 (BM), 2093 (BM); L. Bosumtwi Box 2898 (BM); Akantin Vigne FH 4042 (K); Peji HILL, Anum Adams 143 (K); Accra T. Vogel (K). **Dah.:** Bassa Zoumé Chev. 23644 (ex Tard.). **N.Nig.:** Omuo, Kabba Elliot 73 (K); Naraguta Lely 302 (K); Kilba Hills, Yola Dalz. 247 (K). **S.Nig.:** Olokemeji Jones, Keay & Onochie FHI 4932 (BM); Abeokuta Irving (K).

Widespread in tropical Africa.

2. *Pellaea schweinfurthii* (Hieron.) Diels in E. & P. Pflanzenfam. 1, 4 : 267 (1899).

Roux 2009: Synonym of *Pellaea dura* (Willd.) Hook. var. *schweinfurthii* (Hieron.) Verdc.

*Pteridella schweinfurthii* Hieron. in Engl. Pflanzenw. Ost–Afr. C: 78 (1895).

In rock crevices in open sunny places.

**N.Nig.:** Jos Plateau Lely 294 (BM), 529 (K).

Also in E. Africa.

3. *Pellaea quadripinnata* (Forsk.) Prantl in Engl. Bot. Jahrb. 3 : 420 (1882); Sim F.S.A. 202, t. 92 (1915); Tard. in Mém. I.F.A.N. 28 : 92, t. 14, fig. 5 (1953).

Roux 2009: Synonym of *Cheilanthes quadripinnata* (Forssk.) Kuhn

*Pteris quadripinnata* Forsk. Pl. Aegypt–Arab. 186 (1775).

*Pellaea consobrina* (Kunze) Hook. Sp. Fil. 2: 145, t. 117 A (1858); Syn. Fil. 150 (1867).

Among lava rocks; 5,000 to 8,100 ft. alt.

**Br.Cam.:** Cam. Mt. Mann 1382 (K), 2063 (K); lava flow from Meyer Crater, Cam. Mt. Maitland 964 (BM); Nyonga Camp, Cam. Mt. Maitland 964 (K); Mopanya Kalbreyer 142 (BM); Onyanga Steele 68 (K); Ekundetewa, Mann's Spring Richards 4168 (K).

Also in E. and S. Africa, Madagascar, Arabia and reported from the Cape Verde Islands.

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12. *ASPIDOTIS* Nuttall ex Hook. — Copel. Gen. 68 (1947).

Terrestrial with short–creeping rhizome, covered with narrow scales; stipes brown tufted, polished; fronds subcoriaceous, finely dissected with acute pinnules; sori small, linear with reflexed false indusium; paraphyses none.

*Aspidotis schimperi* (Kunze) Pic.–Sér. in Webbia 7 : 326 (1950).

Roux 2009: Synonym of *Cheilanthes schimperi* Kunze

*Cheilanthes schimperi* Kunze Farnkr. 1 : 52, t. 26 (1840); Hook. Syn. Fil. 133 (1867).

*Hypolepis schimperi* (Kunze) Hook. Sp. Fil. 2 : 70 (1852); Engl. Pflanzenw. Afr. 2: 40, fig. 34 (1908); Sim F.S.A. 239, t. 116 (1915).

Terrestrial near rocks in relatively dry areas.

**N.Nig.:** Kufena Rock, Zaria Keay FHI 25916 (BM, K); Jos Plateau Lely 296 (K); Vom, Jos Plateau Dent Young 267 (K); Naraguta Lely 303 (K).

East to Abyssinia and south to Rhodesia.

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13. *ACTINIOPTERIS* Link — Sim F.S.A. 250; Copel. Gen. 72.

Terrestrial fern with a short–creeping rhizome, densely covered with persistent stipe–bases, and with scales; fronds small digitate with linear, glabrous, coriaceous segments; sori on longitudinal veins protected by a reflexed margin; paraphyses none.

*Actiniopteris radiata* (Koen. ex Poir.) Link Fil. Spec. 80 (1841); Hook. Ic. Pl. t. 975 (1854); Cent. Ferns, t. 75 (1854); Bedd. Ferns S. Ind. t. 124 (1863); W. Cross in Gard. Chron. 1870: 244, fig. 41; Engl. Pflanzenw. Afr. 2 : 42, fig. 37 (1908).

Roux 2009: Accepted name

*Acrostichum radiatum* Koen. ex Poir. Encycl. Suppl. 1 : 128 (1810).

*Actiniopteris australis* var. *radiata* (Koen. ex Poir) C.Chr. in Dansk. Bot. Ark. 7 : 125 (1932).

Crevices in rocks.

**N.Nig.:** Vango, Malaba Hills, Yola Prov. Dalz. 246 (K).

Also in Cape Verde Islands, French Cameroons (Vaillant 339), E. and S. Africa, S. India and Ceylon.

Besides the above, *A. australis* (Linn. f.) Link occurs at Mokolo, French Cameroons (Vaillant 510 (P)) and may be found in our area.

## 18. LINDSAYACEAE

Terrestrial, or epiphytic (not in W. Africa), ferns with creeping protostelic or solenostelic rhizomes; indumentum scaly, sometimes with transition to hairs. Fronds not articulate to rhizome, pinnate or bipinnate, glabrous; stipe with 2 C-shaped vascular bundles back to back as in *Asplenium*; venation free or sparsely reticulate without free included veinlets. Sori marginal coenosori, indusiate with linear indusia opening outwards, a false indusium consisting of the modified leaf-margin may also be present. Sporangia with rather long stalks having 3 rows of cells; annulus with 10 indurated cells. Spores trilete, without perispores. Paraphyses wanting.

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*SCHIZOLEGNIA* Alston in Bol. Soc. Brot., sér. 2A, 30: 23 (1956).

*Schizoloma* Fée — Sim F.S.A. 130 (1915), not of Gaudich.

*Lindsaea* of Copel. Gen. 52 (1947), partly.

Terrestrial ferns with slender creeping rhizomes, clothed with narrow brown scales at the apex; stipes slender, angled, somewhat sulcate above; fronds lanceolate, simply pinnate; pinnae not articulate, more or less equal-sided, costate; veins sparingly anastomosing or free; sori linear marginal, usually continuous; indusia linear, opening outwards; spores trilete.

*Schizolegnia ensifolia* (Sw.) Alston l.c. 24 (1956).

Roux 2009: Synonym of *Lindsaea ensifolia* Sw.

*Lindsaea ensifolium* Sw. in Schrad. Journ. für Bot. 1800, 2: 77 (1801); Hook. Syn. Fil. 112 (1867).

*Schizoloma ensifolium* (Sw.) J. Sm. in Hook. Journ. Bot. 3: 414 (1841); Sim F.S.A. 130, t. 39 (1915); Engl. Pflanzenw. Afr. 2: 23, fig. 19 (1908); Ogata Ic. Fil. Jap. 6: t. 293 (1935); Guinea En el pais de los Bubis: 73 (1949); Tard. in Mém. I.F.A.N. 28: 63 (1953).

In swampy ground, especially margin of mangrove swamp.

**Fr.G.:** (Tard.) **Ghana:** Ancobra R. Morton (BM). **S.Nig.:** Ikoyi Plains, Lagos Dalz. 1419 (K); Jameison R., Sapoba Richards 3922 (BM, K); R. Nun Mann 541 (K). **F.Po:** (ex Guinea on map).

Also Gabon, S. and E. Africa, and in tropical Asia.



## 19. GRAMMITIDACEAE

Epiphytes or rock plants with creeping or ascending solenostelic rhizomes or vascular system somewhat dissected; scales brown, often with stiff unicellular hairs. Stipes not jointed to the rhizome, with 1–2 vascular strands, often with spreading unicellular hairs. Fronds simple to bipinnatifid with lobes usually entire; sometimes coated with a white mealy substance; veins free. Sori round or elliptic, superficial. Sporangia glabrous or bearing stiff bristles, with long stalks sometimes only one cell thick and 10 indurated cells. Spores trilete. Spine-like hairs reported on the prothallus of one species.

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*XIPHOPTERIS* Kaulf. (1824) — Copel. Gen. 214 (1947).

*Ctenopteris* Blume (1828); Copel. Gen. 218 (1947).

- 1        Sporangia not setose; texture firm; rhizome–scales lanceolate, clathrate; rachis and stipes stiff and erect:        2  
      Sporangia setose; texture membranaceous; rhizome–scales hair-like; rachis filiform, flexuose; stipes very short, pendulous; fronds linear, with ovate, adnate, shortly decurrent segments with pinnately branched veins    6. *elastica*
- 2        Fronds sessile or subsessile; rhizome short–creeping or erect:        3  
      Fronds stipitate; rhizome creeping: ----- 5
- 3        Surface of fronds glabrous, up to 3.8 cm. long; costae simple:        4  
      Surface of fronds pubescent with scattered white powder; fronds uniformly pinnatifid 2/3 way to the rachis, with 2–6 sori in each segment ----- 3. *punctata*
- 4        Upper half of fronds only fertile with confluent sori, subentire; lower half sterile, pinnatifid half way to rachis; rhizome–scales yellowish brown, with thin-walled cells  
      1. *serrulata*  
      Fronds uniformly pinnatifid almost to the rachis, with a single elongate sorus on each segment; rhizome–scales dark brown, with thick-walled cells ----- 2. *oosora*
- 5        Fronds clothed with long red bristle-like hairs on the lower surface, about 15 cm. long and 25 cm. broad; rhizome–scales light brown        4. *villosissima*  
      Fronds glabrous, about 12.5 cm. long and under 1.25 cm. broad; rhizome–scales brownish grey, with a metallic sheen ----- 5. *rigescens*

1. *Xiphopteris serrulata* (Sw.) Kaulf. Enum. Fil. 85 (1824); Copel. in Amer. Fern Journ. 42: 48 (1952); Tard. In Mém. I.F.A.N. 28: 208, t. 4, fig. 7, 8 (1953).

Roux 2009: Synonym of *Cochlidium serrulatum* (Sw.) L.E.Bishop

*Acrostichum serrulatum* Sw. Prod. Fl. Ind. Occ. 128 (1788).

*Grammitis serrulata* (Sw.) Sw. in Schrad. Journ. für Bot. 1800, 2: 18 (1801); Schkuhr Krypt. Gew. 9: t. 7 (1809); Hook. Exot. Fl. t. 78 (1823); Fée Gen. Fil. 100, t. 10 B (1852).



*Polypodium serrulatum* (Sw.) Mett. Fil.Herb. Lips. 30 (1856); Engl. Pflanzenw. Afr. 2: 50, fig. 46A, B (1908); Hieron. in Hedwigia 44: 80 (1905), not of Sw. (1801).

*P. duale* Maxon in Contr. U.S. Nat. Herb. 16: 61 (1812); 17: 399, fig. 8 (1914).

On trees in forest.

**S.L.:** Sugar Loaf Mt. Barter (K). **Fr.G.:** Ziama Massif Schnell 2727 (ex Tard.). **Lib.:** Bilimu Harley 185 (BM, K); Gola Forest Bunting (BM); Butan, Sinoe Baldwin 11494 (K); Duo, Sinoe Baldwin 11340 (K); Truo, Sinoe Baldwin 11381 (E). **Iv.C.:** Cavally Basin Chev. 19693 (ex Tard.). **F.Po:** Mann (BM).

**Tropical Africa, America, Mascarenes and Amsterdam Islands.**

## 2. *Xiphopteris oosora* (Bak.) Alston in Bol. Soc. Brot., sér. 2A, 30: 26 (1956).

Roux 2009: Synonym of *Lellingeria oosora* (Baker) A.R.Sm. & R.C.Moran

*Polypodium oosorum* Bak. in Bol. Soc. Brot. 4: 154, t. 2, fig.A (1887); Hieron. in Hedwigia 44: 94 (1905); Tard. in Mém. I.F.A.N. 28: 223, t. 42, fig. 1, 2 (1953).

*P. newtoni* Bak. in Kew Bull. 1896: 41.

On trunks of trees with mosses; 4,500 to 9,000 ft. alt.

**Fr.G.:** Nimba Mts. Abbayes 623 (BM), Schnell 391 (P), 1048 (P), 3518 (K); Ziama Massif Schnell 2719 (P). **S.L.:** Bérigbé, Loma Mts. Jaeger 1459 (K). **Br.Cam.:** Cam. Mt. Adams 1303 (BM); Buea Preuss 1045 (ex Hieron.). **F.Po:** Clarence Peak Newton (ex Bak.).

**Also in S. Tomé Nyasaland and Madagascar.**

## 3. *Xiphopteris punctata* (Ballard) Alston l.c. (1956).

Roux 2009: Synonym of *Lellingeria oosora* (Baker) A.R.Sm. & R.C.Moran

*Ctenopteris punctata* Ballard in Kew Bull. 1955: 468; Harley in Contr. Gray Herb. 177: 93, t. 1 (1955).

On high trees.

**Lib.:** Butan, Sinoe Co. Baldwin 11493 (K).

## 4. *Xiphopteris villosissima* (Hook.) Alston l.c. 27 (1956).

Roux 2009: Synonym of *Zygophlebia villosissima* (Hook.) L.E.Bishop

*Polypodium villosissimum* Hook. Spec. Fil. 4: 197 (1862); Tard. in Mém. I.F.A.N. 28: 224, t. 42, fig. 3, 4 (1953).

*Ctenopteris villosissima* (Hook.) Harley in Contr. Gray Herb. 177: 92 (1955).

On trees in forest; at higher levels, up to 6,200 ft. alt.

**Fr.G.:** Ziama Massif Schnell 2720 (ex Tard.). **S.L.:** Sugar Loaf Mt. Barter (K). **Lib.:** Bill Harley 181 (BM, K); Bilimu Harley 1978 (BM). **Br.Cam.:** Cam. Mt. Adams 1310 (BM). **F.Po:** Mann (K), Newton (K).

**Also in S. Tomé, Gabon, Belgian Congo, Tanganyika (Stolz 883) and Nyasaland.**

5 *Xiphopteris rigescens* (Bory ex Willd.) Alston l.c. (1956).

Roux 2009: Synonym of *Melpomene flabelliformis* (Poir.) A.R.Sm. & R.C.Moran

*Polypodium rigescens* Bory ex Willd. Sp. Pl. 5: 183 (1810); Engl. Pflanzenw. Afr. 2: 50, fig. 46 F (1908).

On bare lava; 4,000 to 9,500 ft. alt.

**Br.Cam.:** Thomson (K); near Ekundetewa, Mann's Spring Richards 4169 (BM, K); Cam. Mt. Adams 1325 (BM); Onyanga, Cam. Mt. Steele 56 (K). **F.Po:** Mann (K), 361 (K); St. Isabel Peak Boughey (BM).

Also on mountains of E. Africa, Drakensburg, Mascarene Islands and the Andes.

6. *Xiphopteris elastica* (Bory ex Willd.) Alston l.c. (1956).

Roux 2009: Synonym of *Terpsichore cultrata* (Bory ex Willd.) A.R.Sm.

*Polypodium elasticum* Bory ex Willd. Sp. Pl. 5: 183 (1810).

*Polypodium cultratum* var. **elasticum** (Bory ex Willd.) Bak. Syn. Fil. 327 (1874).

On trees at 3,000 ft.

**Br.Cam.:** Thomson (K); Jongo, Mann's Spring Richards 4381 (K). **F.Po:** Mann (BM), 337 (K).

Also S. Tomé and Mascarene islands.

## 20. POLYPODIACEAE

Epiphytes, rarely terrestrial, with creeping rhizomes containing a ring of small vascular bundles; scales peltate, clathrate or not. Fronds borne in 2 ranks on the upper side of the rhizome and jointed to it (except *Loxogramme* and *Stenochlaena*); veins reticulate with free veinlets on the areoles (except *Stenochlaena*). Sori without indusia, round, elongate (*Loxogramme*) or covering a large area of the undersurface (*Platycterium*, *Stenochlaena*). Paraphyses rare. Sporangia with long stalks and 12–16 indurated cells. Spores monolete, without perispores. Gametophytes cordate becoming elongate and thalloid, sometimes with multicellular branching hairs (*Platycterium*, etc.) or papillate hairs (*Stenochlaena*, *Polypodium*), cells sometimes thickened at corners (*Drynariopsis*). Antheridia subglobose, basal cell large, cap cell divided or not.

- 1 Venation copiously reticulate with free veinlets on the areoles: 2  
Venation consisting of free parallel veins with a single row of narrow areoles along the costa; climbing fern with acrostichoid sori ----- 10. *Stenochlaena*
- 2 Fronds covered with stellate hairs at least when young: 3  
Fronds without stellate hairs:----- 4
- 3 Sori acrostichoid; epiphytes with 2 kinds of fronds 1. *Platycterium*  
Sori not acrostichoid -----2. *Pyrrhosia*
- 4 Margin of fronds thickened, distantly serrulate; fronds of two kinds; fertile fronds pinnate and sterile 3. *Drynaria*  
Margin of fronds not thickened, entire; fronds all similar (except *Microgramma*); fronds simple (except *Phymatodes*):----- 5
- 5 Sori acrostichoid confined to narrow apical part of frond 4. *Belvisia*  
Sori not acrostichoid:----- 6
- 6 Sori elongate 5. *Loxogramme*  
Sori rounded: ----- 7
- 7 Paraphyses present: 8  
Paraphyses wanting (in W. African species): ----- 9
- 8 Paraphyses with enlarged apices; fronds mostly pinnatifid with sori sunk in cavities, which appear as protuberances on the upper surface 6. *Phymatodes*  
Paraphyses peltate, conspicuous on young sori, later deciduous; fronds simple (in W. African species) 7. *Pleopeltis*
- 9 Fronds with a single series of areoles on each side of the costa with included free veinlets; sori in two rows; one row of sori on each side of costa 8. *Microgramma*  
Fronds without costal areoles; all areoles with included free veinlets; sori scattered irregularly 9. *Microsorium*

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### 1. *PLATYTERIUM* Desv. — Sim F.S.A. 293 (1915); Copel. Gen. 179 (1947).

- 1 Sporophylls broad, entire or repand, rounded at the apex; pubescence becoming rufous 1. *angolense*  
Sporophylls with narrow lobes, subacute; pubescence grey -----2. *stemaria*

1. *Platycerium angolense* Welw. ex Hook. Syn. Fil 425 (1868); Bak. in Ann. Bot. 5 : 496 (1891); “W.W.” in Gard; Chron. Ser. 3, 23 : 155, fig. 62 (1898); Engl. Pflanzenw. Afr. 2 : t. 3 (1908); Sim F.S.A. 294, t. 155 (1915) . Tard. in Mém I.F.A.N. 28 : 208, t. 41, fig. 2 (1953).

Roux 2009: Synonym of *Platycerium elephantotis* Schweinf.

*Alicornium angolense* (Bak.) Underw. in Bull.Torr Bot. Club 32 : 593 (1905).

*Platycerium elephantotis* Schweinf. in Bot. Zeit. 29 : 361 & fig. (1878).

Epiphytic, or rarely on rocks, in forest legions.

**Fr.G.:** Koulikoro Jaeger 79 (NJ). **S.L.:** Kamalo Thomas 366 (K). **Lib.:** Sakimpa Harley 234 (BM, K). **Iv.C.:** Mt. Oroumbo Boka Abbayes 441 (ex Tard.); Mt. Toakoui Portères (ex Tard.). **Ghana:** Mampong Scarp Adams & Akpabla GC 4526 (BM); Bobiri F.R. Adams 538 (K). **N.Nig.:** Kabba Elliott 70 (K).

**S.Nig.:** Boji enclave, Afi River F.R. Ikom Jones & Onochie FHI 18770 (FHI).

Widespread in tropical Africa.

2. *Platycerium stemaria* (P. Beauv.) Desv. in Mém Soc. Linn. Par. 6 : 213 (1827); Engl. l.c. 59, fig. 59 (1908); Tard. l.c. 210, t. 41, fig. 1 (1953).

Roux 2009: Accepted name

*Acrostichum stemaria* P. Beauv. Fl. Oware 1 : 2, t. 2 (1805).

*Platycerium aethiopicum* Hook. Gard. Ferns t. 9 (1861); Syn. Fil. 425 (1868).

Epiphyte on trees in open or in secondary forest or rain forest at low elevations.

**Fr.G.:** Heudelot 764 (K); Conakry Wolff 45 (BM); Beyla Adam 4968 (ex Tard.) Nzérékoré Region Schnell 2781 (ex Tard.). **S.L.:** Smeathmann (BM), Don (BM), Purdie (BM), Wilford (BM), Barter (K); Sherbro Isl. Hunter 3 (BM); Bumpa Jaeger 2263 (K); Mahnoo Mair (K); Mahera Sc. Elliot 4103 (K).

**Lib.:** Ganta Harley 236 (BM, K). **Iv.C.:** Abidjan to Grand Bassam Abbayes 469 (BM). **Ghana:** Asuansi Box 2058 (BM); Nsuta Cummins 49 (K); New Tafo Lovi (BM). **Dah.:** Dagla Le Testu 215; Labolé Annet 71 (both ex Tard.). **N.Nig.:** Idah Barter 1741 (K). **S.Nig.:** Lagos Millen (K.); Omo (formerly part of Shasha) F.R. Richards 3423 (BM), 3451 (BM); Agulu Thomas 315 (K); Okomu F.R. Ross 120 (BM); Warri Beauvois (BM). **Br.Cam.:** Victoria Kalbreyer 198 (BM); Ekona Plantation, Victoria Thorold 8a (K); near Kumba Thorold 8b (K). **F.Po.:** T. Vogel 185 (K), Mann 146 (K), Barter (K).

Wide spread in tropical Africa.

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2. *PYRROSIA* Mirb. — Copel. Gen. 192 (1947). Cyclophorus Desv. — Sim F.S.A. 283 (1915)

1 Rhizome scales ciliate; fronds widely spaced on a long slender rhizome 1.  
*lanceolata*

Rhizome scales entire; rounded cucullate at apex -----2. *mechowii*

1. *Pyrrosia lanceolata* (Linn.) Farwell in Amer. Midl. Nat. 12 : 245 (1931); Schelpe in Journ. S. Afr. Bot. 18 : 131 (1952); Tard. in Mém. I.F.A.N. 28 : 224 (1953).

Roux 2009: Accepted name

*Acrostichum lanceolatum* Linn. Sp. Pl. 1067 (1753).

*Polypodium adnascens* of Hook. Syn. Fil. 349 (1868), partly, not of Sw.

Epiphyte at about 1,300 ft. alt.

**Br.Cam.:** Barombi Preuss 284 (BM) : Tiko Dunlap 179 (K), 243 (K); Tombel Thorold CP 9 (BM).  
**Also in Principe (Quintas 30), Ubangi, Gabon, French Congo, Belgian Congo, E. Africa and S. Asia.**

2. *Pyrrosia mechowii* (Hieron.) Alston in Contr. Conh. Fl. Moç. 12 : 37 (1955).

Roux 2009: Synonym of *Pyrrosia schimperiana* (Mett. ex Kuhn) Alston var. *schimperiana*

*Cyclophorous mechowii* Hieron. in Engl. Bot. Jahrb. 46 : 395 (1911).

*Pyrrosia schimperiana* var. *merchowii* (Hieron.) Schelpe l.c. 129 (1952); Tard. l.c. 225, t. 43, fig. 5 (1953).

**Fr.G.:** Nimba Mts. Schnell 5040 (ex Tard.). **N.Nig.:** Wana, Mada Hills Hepburn 96 (K). **Br.Cam.:** Johann-Albrechtshöhe Staudt 475(BM, K:); Buea Brenan 4391 (BM, K); Ambas Bay Mann 788 (K).  
**Also south to Angola and in E. Africa.**

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3. *DRYNARIA* (Bory) J. Sm. — Copel. Gen. 203 (1947).

1       Scales not transparent, with short stiff hair-teeth; spores waited       *1. volkensii*  
Scales translucent, long-ciliate; spores papillose ----- *2. laurentii*

1. *Drynaria volkensii* Hieron. in Hngl. Bot. Jahrb. 46 : 393 (1911); Tard. in Mém. I.F.A.N. 28 : 214 (1953).

Roux 2009: Accepted name

Epiphyte on trees, usually at margin of forest and in neglected Cocoa plantations;  
1,300 to 6,000 ft. alt.

**Br.Cam.:** above Bamenda Migeod 434 (BM, K); above Lyonga, Mann's Spring Richards 4377 (BM, K); above Buea Migeod 72 (K). **F.Po:** Mann 339 (K); Bombe Estate, S. Carlos Thorold 23 (BM).  
**Widespread in tropical Africa.**

2. *Drynaria laurentii* (Christ) Hieron. in Engl. Pflanzenw. Afr. 2 : 57 (1908), partly, excl. fig. 54; Tard. L.c. 216, t. 43, fig. 2, 3 (1953).

Roux 2009: Accepted name

*Polypodium propinquum* **var. laurentii** Christ in Ann. Mus. Congo, sér. 5, 1 : 6, t. 2 (1903).

Epiphyte, 600 to 2,700 ft. alt.

**Fr.G.:** (ex Tard.). **S.L.:** Don (BM); Njala Deighton 2546 (K, NJ); Makali, E. of Magburaka T.S. Jones 36 (BM); Nerekoro, Mabonto Dist. T. S. Jones 34 (BM); Bumban Thomas 1999 (K). **Lib.:** Bili Harley 235 (BM); Ganta Harley 49 (K). **Iv.C.:** (ex Tard.). **Ghana:** Pami Bepo, Kibi Chipp 555 (K); Puso Puso Ravine, Atewa Range Box 3274 (BM); Begoro, Akim Irvine 1177 (K). **Togo:** Amedzofe Box 3435 (BM). **S.Nig.:** Carter Peak, Idanre Hills Keay FHI 22655 (BM); Afi River F.R. Jones & Onochie FHI 18614 (BM).

Widespread in tropical Africa. (Fig. 11.)

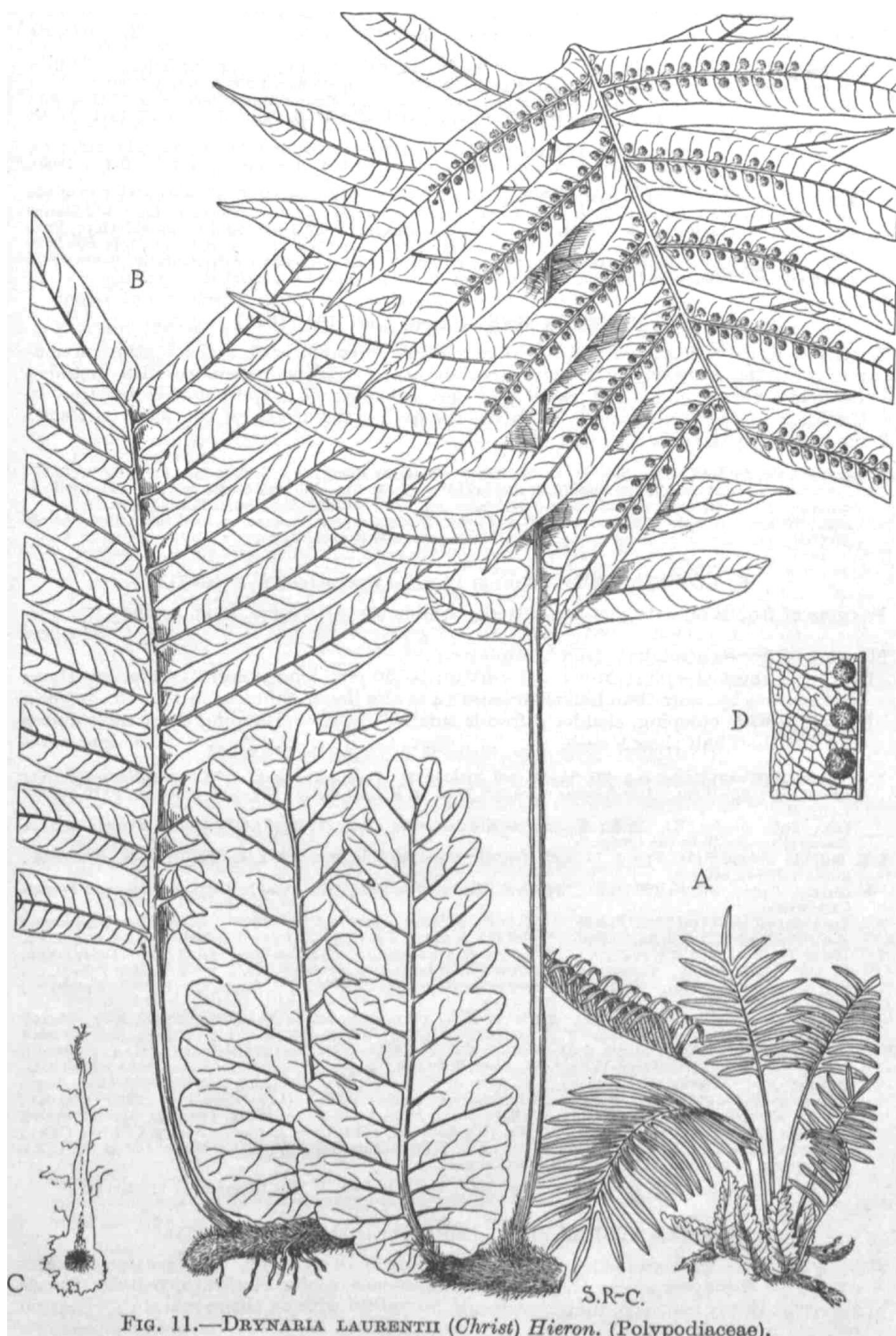


FIG. 11.—*DRYNARIA LAURENTII* (Christ) Hieron. (Polypodiaceae).

Fig. 11.—*Drynaria laurentii* (Christ) Hieron. (Polypodiaceae).

A, habit, much reduced. B, habit, showing sterile frond on left, fertile frond on right and two humus-collecting bracket fronds in centre, x 1/2. C, rhizome; scale, x 6. D. undersurface of pinnule showing venation and sori, x 1 1/8.

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4. *BELVISIA* Mirb. — Copel. Gen. 191 (1947).

Epiphytic ferns with simple fronds; rhizome short–creeping with scales; stipes articulate; lamina narrowly elliptic–linear glabrous; venation reticulate with included veinlets; lateral veins not developed or inconspicuous; sporangia reticulated to the apex of the frond, which is linear, occupying the whole of the lower surface; annulus with 14 cells.

*Belvisia spicata* (Linn. f.) Mirb. Hist. Nat. Pl. 4: 65 (1863); Tard. in Mém. I.F.A.N. 28: 207, t. 43, fig. 1 (1953).

Roux 2009: Accepted name

*Acrostichum spicatum* Linn. f. Suppl. Pl. 444 (1781); Hook. Syn. Fil. 424 (1868), partly.

*Hymenolepis spicata* (Linn, f.) Presl in Abh. K. Böhrn. Ges. Wiss. ser, 5, 6: 489 (1851); Epim. Bot. 159 (1852).

**Iv.C.:** Nimba Mts. Schnell 397 (ex Schnell & Tard.). **Br.Cam.:** near Nyasaso, on road to Tombel Thorold 18 (BM, K).

Also in **S. Tomé**, **Tanganyika**, **Mascarenes** and **tropical Asia**.

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5. *LOXOGRAMME* (Blume) Presl — Copel. Gen. 217 (1947).

1 Margins of fronds sinuate; stipes tufted; fronds up to 12–5 cm. long, sessile

*1. buettneri*

Margins of fronds straight; fronds stipitate:----- 2

2 Rhizomes short–creeping, stout; fronds up to 30 cm. long; sori overlapping those next above by more than half their length; scales linear–subulate, black *2. latifolia*

Rhizomes wide–creeping, slender; fronds smaller; sori overlapping those next above by less than half their length

-----*3. lanceolate*

1. *Loxogramme buettneri* (Kuhn) C.Ch. Ind. Fil. Suppl. pré. 21 (1917).

Roux 2009: Accepted name

*Polypodium buettneri* Kuhn in Verb. Bot. Ver Brand. 31: 68 (1889).

*Loxogramme chevalieri* Tard. in Mém. I.F.A.N. 28: 214, t. 40, fig. 9, 10 (1953).

Epiphyte.

**Lib.:** Suen Linder (K). **Iv.C.:** Danané to Goutokouma Chev, 21310 (P). **Br.Cam.:** Ekundu N'dene Dusen (P).

South to the Congo.

2. *Loxogramme latifolia* Bonap. Notes Ptérid. 14: 334 (1924); Tard. in Mém. l.c. 213, t.



40, fig. 7 (1953).

Roux 2009: Accepted name

On trees; about 1,300 ft. alt.

**Ghana:** Begoro Adams 459 (BM); Apapam, Kibi Adams 970 (BM).

Also in Belgian Congo and French Cameroons.

3. *Loxogramme lanceolata* (Sw.) Presl Tent. Ptérid. 215, t. 9, fig. 8 (1836); Tard. l.c. 213 (1953).

Roux 2009: Synonym of *Loxogramme abyssinica* (Baker) M.G.Price

*Polypodium loxogramme* Mett. Polypod. 112, t. 3, Fig. 25 (1857); Sim F.S.A. 281, 1.146 (1915).

*Grammites lanceolata* Sw. in Schrad. Journ. für Bot. 1800, 2: 18 (1801).

*Gymnogramme lanceolata* (Sw.) Hook. Spec. Fil. 5: 156 (1864); Syn. Fil. 387 (1867), partly.

*Loxogramme suberosa* Christ in Ann. Mus. Congo, sér. 5, 3: 37 (1909); Tard. l.c. 213, t. 40, fig. 8.: (1953).

*Polypodium suberosum* (Christ) C.Christ. Ind. Fil. Suppl. 62 (1918).

Epiphyte; up to 7,000 ft. alt.

**Fr.G.:** Macenta Baldwin 9779 (K). **S.L.:** Barter (K); near Kasokora DeigHton 1236 (K, NJ); Makali Deighton 4396 (NJ); Bintumane T. S. Jones 19 (BM, NJ), Jaeger 293 (K). **Lib.:** Ganta Baldwin 9649 (BM), Harley 224 (BM); Siaple Baldwin 9442 (BM, K); Wanau Harley 149 (BM), 228 (BM, K); Gbeidin Harley 224 (BM); Nekabozu, Vonjama Baldwin 9962 (K). **Iv.C.:** Mt. Oroumbo Boka Abbayes 429 (BM). **Ghana:** Aburi Adams 400 (BM, K); N. Ashanti Dalz. 75 (K); Akropong Johnston 992 (K). **Togo:** Amedzofe Box 3431 (BM). **N.Nig.:** Awton Elliott 74 (K). **S.Nig.:** Ondo Keay FBI 22558 (BM, K); Idanre Richards 3773 (K). **Br.Cam.:** above Buea Migeod 142 (K); below Liwonge, Mann's Spring Richards 4248 (K); Cam. Mt., Mann 1381 (K), 2056 (K); L. Nyos, Bamenda Savory UCI 348 (BM); Onyanga Steele (K); Barombi Preuss 196 (K). **F.Po:** Mann (K), 373 (K); Moka Adams 2965 (K).

Widespread in tropical Africa and the Mascarene Islands.

I have maintained this species in a broad sense but it is possible that it should be subdivided.

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6. *PHYMATODES* Presl — Holtt. Ferns Malaya 188 (1955).

Epiphytic ferns with wide-creeping green almost bare rhizome, with scattered scales except at the apex where they are membranous; scales clathrate, peltate, fronds glabrous, thinly leathery, simple or deeply pinnatifid with an entire margin; venation reticulate with included veinlets; sori large, sunk in cavities; paraphyses present.

*Phymatodes scolopendria* (Burm.) Ching in Contrib. Inst. Bot. Nat. Acad. Peiping 2: 63 (1933); Tard. in Mém. I.F.A.N. 28: 222, t. 43, fig. 4 (1953).

Roux 2009: Synonym of *Microsorium scolopendria* (Burm.f.) Copel.

*Polypodium scolopendria* Burm. Pl. Ind. 232 (1768).

Common on trees or rocks in second growth and fringing forest.

**Fr.G.:** (ex Tard.). **S.L.:** Smeathmann (BM); Newton T. S. Jones 329 (BM, NJ); Njala Deighton 1837 (K, NJ); near Pujehun Deighton 264 (K, NJ); Sherbro Isl. Hunter (BM); W. slope of Loma Mts. Jaeger 1807 (K); Moria, Scarcies Elliott 5917 (K). **Lib.:** Sim (BM), Linder 61 (K), 56 (K); Grand Bassa McWilliam (BM), T. Vogel 24 (K); White Plains Barker 1349 (K); Ganta Harley 9 (K); Cape Palmi Schnell (K); Sinoe Basin Johnston (K). **Iv.C.:** Adiopodoumé Abbayet 232 (BM); Sampleu, Dyalas Chev. 21103 (K); Région des Lagunes Cervoni (K). **Dah.:** Porto Novo Chev. 23333 (K). **Ghana:** Aburi Box 2088 (BM), Darko MDA 7 (K), Adams 31 (K); B. Nhwim, W. of Takoradi Box 2077 (BM); Asuansi Box 2037 (BM), 2071 (BM), 2060 (BM); Eumasi Vigne FH 3050 (K); Wankye, Birrim Chipp 562 (K). **Togo:** Lome Warnecke 405 (BM, K). **N.Nig.:** Alekpo Elliot 82 (K); Idah Barter 1466 (K). **S.Nig.:** Lagos Dalz 1100 (K), Fraser 13 (BM); Abeokuta Irving (K); Idanre Richards 3829 (BM, K); Okomu F.R. Richards 3866 (BM, K); Ibo country T. Vogel 23 (K). **Br.Cam.:** Johann-Albrechtshöhe Staudt 885 (BM); Victoria Rosevear 36/37 (BM); Bibundi 3624 (BM); Debunscha Thorold TN 2 (BM, K); Tiko Dunlap 178 (K). **F.Po:** Mann (BM), 128 (K), Barter (K), Bradley Gregory (BM), T. F-jyeZ 172 (K); near Bombe Estate, San Carlos Thorold TF 25 (BM).

Also throughout the Old World tropics.

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## 7. *PLEOPELTIS* Humb. & Bonpl. ex Willd. — Copel, Gen. 183 (1947).

**1** Lower surface of frond glabrous; texture herbaceous and veins visible; sori more or less sunk in cavities on the frond: **2**

Lower surface of frond dotted with minute scales; texture coriaceous and veins invisible; scales brown; stipes distant; sori superficial ----- **3. lanceolate**

**2** Scales almost black; stipes rather close together **1. preussii**

Scales brown; stipes distant ----- **2. nicklesii**

**1. *Pleopeltis preussii* (Hieron.) Tard.** in Mém. I.F.A.N. 217, t. 44, fig. 6–8 (1953).

Roux 2009: Synonym of *Lepisorus excavatus* (Bory ex Willd.) Ching

*Polypodium preussii* Hieron. in Engl. Bot. Jahrb. 46: 386 (1911), incl. vars. *ledermannii*, *angustipaleacea*, *angustifolia* and *winkleri*.

On trees in forest, 3,000 to 5,000 ft. alt.

**Fr.G.:** Mt. Nimba Schnell 1479, 2945 (ex Tard.). **S.L.:** Bintumane Peak Jaeger 1169 (K). **Lib.:** Bilimu Harley 99 (BM, K). **Iv.C.:** Mt. Momy Chev. 21380 (ex Tard.). **N.Nig.:** Jos Plateau Dent Young 271 (K). **Br.Cam.:** Buea Migeod 34 (BM, K), 71 (BM), Preuss 924, (K), 929, 862, 1042 (all ex Hieron.) Seder 1029 (B); Cam. Mt. Johnston 132 (BM); Litoka, Cam. Mt. Maitland 1092 (E; Bamenda Rosevear (BM); Bagangu, near Mpongu Ledermann 5868 (ex Hieron.). **F.Po:** Mann (BM, (K), 449 (K), 379 (K).

Also in French Camerouns.

Of the varieties described by Hieronymus, var. *winkleri* was described as having a median line of dark cells on the scales and the veins not conspicuous, var. *angustifolia* with narrow subchartaceous fronds, vars. *angustipaleacea* and *ledermannii* with membranous leaves, the former with scales longer and narrower than in the typical form

and the latter with blacker scales. The fronds are chartaceous with the veins conspicuous on the upper surface in typical *P. preusii*.

2. *Pleopeltis nicklesii* (Tard.) Alston in Bol. Soc. Brot., sér. 2A, 30: 22 (1956).

Roux 2009: Accepted name

*Polypodium nicklesii*. Tard in. Bull. Soc. Bot. Fr. 90: 97, fig. 3, 4 (1943).

*Pleopeltis rotunda* Tard. in Mém. I.F.A.M. 28: 219, t. 44, Fig. 9–11 (1954), excl. syn. Bonap.

On rocks and trees.

**Fr.G.:** Kéniekoundé Nicklès (P).

3. *Pleopeltis lanceolata* (Linn.) Kaulf. Enum. Fil. 245 (1953); Tard. in Mém. I.F.A.N. 28: 217, t. 44, fig. 2,3, 4 (1953).

Roux 2009: Synonym of *Pleopeltis macrocarpa* (Bory ex Willd.) Kaulf.

*Polypodium lanceolatum* Linn. Sp. Pl. 1082 (1753).

On trees or rocks; 5,000 to 9,000 ft. alt.

**Fr.G.:** Tibie Peak Adam 503 (ex Tard.). **S.L.:** Loma Mts. Jaeger 290 (K, NJ); Bintumane T. S. Jones 39 (BM, NJ). **Iv.C.:** Man Portères (ex Tard.). **Br.Cam.:** Cam. Mt. Mann 1374 (K), 2005 (K), Adams 1275 (BM), 1286 (BM), 1333 (BM); Mann's Spring Richards 4217 (BM, K); Nkambe, Bamenda Savory UCI 356 (BM). **F.Po:** Moka Adams 1101 (BM), Guinea 1956 (BM).

Also in Africa generally Including St. Helena, tropical America and tropical Asia.

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8. *MICROGRAMMA* Presl — Copel. Gen. 185 (1947).

Epiphytic ferns with wide–creeping rhizomes, clothed with lanceolate peltate scales; stipes remote, articulate; fronds simple, entire, somewhat dimorphic with the fertile fronds narrower than the sterile; veins anastomosing.

*Microgramma owariensis* (Desv.) Alston in Bol. Soc. Brot., sér. 2A, 30: 20 (1956).

Roux 2009: Synonym of *Microgramma mauritiana* (Willd.) Tardieu

*Polypodium owariense* Desv. in Mag. Ges. Naturf. Fr. Berl. 5: 314 (1811).

*Microgramma lycopodioides* Tard. in Mém. I.F.A.N. 220, t. 49 fig. 1 (1953).

*Polypodium lycopodioides* of various African authors.

On trees in forest, up to 1,000 ft. alt.; very common in Sierra Leone.

**Fr.G.:** Conakry Bruun 44 (BM); Macenta Baldwin 9844 (K). **S.L.:** Kenema Small 80 (K, NJ); Musaia Brighton 4889 (NJ); Njala Deighton 1838 (K, NJ); Pendembu T. S. Jones 30 (BM); Freetown Barter 9 (BM); Regent Sc. Elliot 4046 (BM, K). **Lib.:** Linder 55 (K); Suacoco Barker 1392 (K); Nyaake, Webo Baldwin 6123 (K); Bushrod Isl. Barker 1294 (K); Ganta Harley 21 (K); Grand Bassa T. Vogel 98 (K). **Iv.C.:** Mt. Oroumba Boka Abbayes 416 (BM); Sokonantra to Sampleu Chev. 21099 (K). **Ghana:**

Asuansi Box 2038 (BM); Bunso Gillett 155 (BM); Aburi Adams 176 (K), Howes 1190 (K); Axim Irvine 2805 (K); Kumasi Vigne FH 3047 (K). **Togo:** Amedzofe Box 3432 (BM). **N.Nig.:** S. of Kabba Elliott W (K). **S.Nig.:** banks of R. Nun Mann 542 (K); Omo (formerly part of Shasha) F.R. Ross 180 (BM), 267 (BM), Richards 3390 (BM), 3174 (BM), 3008 (BM); Okomu F.R. Richards 8676 (BM, K), 3883 (BM, K); Onitsha Barter 1448 (K); Afi River F.R. Jones & Onochie FHI 17342 (BM), 18615 (BM); Calabar Richards 3969 (BM, K); Brass Barter 1815 (K). **Br.Cam.:** Bebunscha Thorold TN 1 (BM, K); Victoria Rosevear 37/37 (BM), Schlechter 12367 (BM). **F.Po:** Mann 375 (K); Laka Thorold TF 80 (BM); Nimbo Bay (?) Barter (K).

Widespread In tropical Africa.

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## 9. *MICROSORIUM* Link — Copel. Gen. 195 (1947).

Epiphytic ferns; rhizome short–creeping, with dark scales; fronds simple (in W. African species) thinly leathery, glabrous, with entire margins; venation reticulate with included free veinlets; sori compital, without paraphyses.

*Microsorium punctatum* (Linn.) Copel. in Univ. Cal. Publ. Bot. 16: 111 (1929); Ching in Bull. Fan Mem. Inst. Biol. 4: 307 (1933); Tard. in Mém. I.F.A.N. 28: 221, t. 41, Fig. 3, 4 (1953).

Roux 2009: Synonym of *Microsorium punctatum* (L.) Copel.

*Acrostichum punctatum* Linn. Sp. Pl. 2: 1524 (1753).

*Polypodium polycarpon* Cav. ex Sw. in Schrad. Journ. für Bot. 1800, 2: 21 (1801).

*P. irioides* Poir. in Lam. Encycl. Méth. 5: 513 (1804); Ogata Ic. Fil. Jap. 6: 1.136 (1980).

*P. crassinerve* Schum. in E. Danske Vidensk. Selsk. 4: 227 (1829).

*P. punctatum* (Linn.) Sw. l.c. (1801), sot of Thunb. (1784).

**Fr.G.:** (ex Tard.). **S.L.:** Mahnoo Mair (K). **Lib.:** T. Vogel 3 (K); Grand Bassa McWilliam (BM); Ganta Harley 20 (K); Gbanga Linder 759 (K). **Iv.C.:** (ex Tard.). **Ghana:** Asuansi Box 2046 (BM), 2096 (BM); Akwapim Thonning (C); New Tafo Usher 22 (BM); Aburi Deighton 631JE). **S.Nig.:** Omo (formerly part of Shasha) F.R. Ross 86 (BM), Richards 3404 (BM), Jones & Onochie FHI 16958 (BM, K); Idanre Richards 3827 (BM, K); Ajagbodudu, Benin Wright 4 (K). **Br.Cam.:** Cam. Mt. Kalbreyer 201 (BM); Mamfe Rosevear (BM); Victoria Rosevear 39/37 (BM); Bebunscha Thorold TN 6 (BM, K). **F.Po:** Bradley Gregory (BM), T. Vogel (K), Barter (K); Laka Thorold TF 28 (BM); Ureka Guinea 2388 (BM); Clarence Peak T. Vogel 112 (K).

Old World tropics generally.

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## 10. *STENOCHLAENA* J. Sm. — Sim F.S.A. 191 (1915); Copel. Gen. 161 (1947).

Large scandent ferns; rhizome almost naked with a few peltate scales towards the apex; stipes remote; fronds dimorphic, pinnate; lateral pinnae articulated to the rachis, glabrous, with firm texture, margin sharply cartilaginous–serrate; veins forming a single row of narrow areoles on each side of the costa, free elsewhere; fertile fronds with linear entire pinnae, with sporangia covering the entire surface; paraphyses wanting.

*Stenochlaena mildbraedii* Brause in Engl. Bot. Jahrb. 53 : 884 (1915) ; Mildbr. Wiss. Ergebn. 1910–11, 2 : 177 (1922); Tard. in Mém. I.F.A.N. 28 : 87, t. 39, fig. 5, 6 (1953).

Roux 2009: Synonym of *Stenochlaena tenuifolia* (Desv.) T.Moore

Root-climber on stems of *Raphia* palms: about 1,500 ft. alt.

**F.Po:** Musola Mildbr. 6995 (ex Brause).

Also French Cameroons, south to Angola and east to Uganda (Lind)

## 21. DAVALLIACEAE

Epiphytes with wide-creeping rhizomes, rarely terrestrial or suberect (*Nephrolepis*); tubers sometimes present (*Nephrolepis*); scales peltate; stipes jointed to the rhizome, except in *Nephrolepis* and *Arthropteris* where the pinnae are jointed to the rhachis. Stipes with several vascular strands. Fronds simple in *Oleandra*, pinnate in *Nephrolepis* and *Arthropteris* and finely dissected in *Davallia*; ultimate leaflets unequal at base. Sori terminal on veins or superficial (*Oleandra*); sori with a basal indusium opening outwards. Sporangia long-stalked, with 12–14 indurated cells. Spores monolete, without perispore. Prothallus cordate giving rise to adventive prothalli (*Oleandra*).

- 1 Pinnae jointed to the rhachis; fronds pinnate: 2  
Pinnae not jointed to the rhachis: ----- 3
- 2 Main stem not jointed towards the base; rhizome short, erect 1. *Nephrolepis*  
Main stem jointed towards the base; rhizome slender, creeping ----- 2. *Arthropteris*
- 3 Fronds simple; sori dorsal on veins 3. *Oleandra*  
Fronds finely dissected; sori terminal on veins with basal indusium ----- 4. *Davallia*
- 

### 1. *NEPHROLEPIS* Schott — Sim F.S.A. 124 (1915); Copel. Gen. 90 (1947).

- 1 Indusium facing the apex of the pinna, usually with an open sinus; plants often with tubers: 2  
Indusium facing the lateral margin of the pinna, with a deep narrow sinus; plants never with tubers 3. *biserrata*
- 2 Rhizome short, less than 1 cm. long; fronds divergent; pinnae in vertical plane, about 40-jugate 1. *undulata*  
Rhizome erect, about 2 cm. long; fronds stiffly erect; pinnae horizontal, up to 100-jugate ----- 2. *pumicicola*

1. *Nephrolepis undulata* (Afzel. ex Sw.) J. Sm. in Curt. Bot. Mag. 72, Comp. 35 bis (1846); Tard. in Mém. I.F.A.N. 28 : 155 (1953).

Roux 2009: Accepted name

*Aspidium undulatum* Afzel. ex Sw. In Schrad. Journ. für Bot. 1800,2 : 32 (1801).

*Nephrolepis cordifolia* of Hook. Syn. Fil. 300 (1867) partly, not of Presl. N. filipes Christ in Ann. Mus. Congo sér. 5, 1 : 213 (1906); Tard. l.c. 154, t. 8, fig. 3,4 (1953).

Common in shade and in the open; epiphytic or terrestrial; up to 5,400 ft. alt.

**Fr.Sud.:** near Kangala Chev. 845 (K). **Fr.G.:** Nimba Mts. Schnell 1833 (P); Kouria Caille 14897 (K); Konosso, Gueckédou Adam (P). **S.L.:** Afzelius (BM); Musaia, Dembelia Small 207 (NJ); Sugar loaf Mt. T. S. Jones 336 (BM, NJ); Makali, E. of Magburaka T. S. Jones 36 (BM); Bintumane T. S. Jones 23 (BM), Jaeger 467 (K); Freetown Johnston (BM), 13 (K), 19 (K), . 8, 8 bis (BM); Regent Sc. Elliot 1891

(K). **Lib.:** Kitomu Harley 157(BM); Ganta Harley 2 (K); Banga Linder 1161 (K); Zwedru, Tchien Baldwin 7075 (K). **Iv.C.:** Mt. Oroumba Boka Abbayes 406 (BM); Touba Papion du Château (K). **Ghana:** Bosuso Adams 464 (BM); Begoro Adams 435 (BM, K); Mampong Scarp Adams & Akpabla GC 4532 (BM); Techiman Adams & Akpabla GC 4481 (BM); Bunsu, near Kibi Box 2940 (BM). **Togo:** Togo Plateau F.R. St. C. Thompson 1525 (K). **Dah.:** Mt. Atacora Chev. 24182 (K). **N.Nig.:** Zagun, Jos Plateau Keay FHI 20081 (BM); Patti Lokoja Dalz. 243 (K); Naraguta Lely 301 (K), 309 (K); Katsina Ala Dalz. 794 (K); Kabba Elliott 68 (K). **S.Nig.:** Abeokuta Irving (K); Iseyin Thorold 9a (BM, K); Usonigbe F.R., Keay & Onochie FHI 19699 (BM); Onitsha Barter 1742 (K); Umuahia Jones FHI 4536 (BM). **Br.Cam.:** Bamenda Rosevear (BM); Buea Richards 4122 (BM, K); Mamfe Rosevear (BM). **F.Po:** Laka Thorold 24 (BM).

Tropical Africa generally including Cape Verde Islands.

## 2. *Nephrolepis pumicicola* Ballard in Kew Bull. 1955: 467.

Roux 2009: Synonym of *Nephrolepis cordifolia* (L.) C.Presl var. *pumicicola* (F.Ballard.) Hovenkamp & Miyam.

On volcanic lava, up to 7,600 ft. alt.

**Br.Cam.:** Cam. Mt. Johnston (BM), Mann 1396 (K); lava flow, between Isobi & Bibundi Keay FHI 28655 (K, BM), 28658 (BM), Mildbraed 10678 (K); Buea Fraser 35 (BM), 36 (BM); Litoka Maitland 1091 (K). **F.Po:** Moka Exell 827 (BM), Adams 1084 (BM); Musola Guinea 1243 (BM).

Also in S. Tomé

## 3. *Nephrolepis biserrata* (Sw.) Schott Gen. Fil. sub t. 3 (1834); Sim F.S.A. 125 t.35 (1915); Tard. in Mém. I.F.A.N. 28 : 154.

Roux 2009: Accepted name

*Aspidium biserratum* Sw. in Schrad. Journ. für Bot. 1800, 2 : 32 (1801).

*A. guineense* Schum. in K. Danske Vidensk. Selsk. 4 : 229 (1829).

*Nephrolepis acuta* (Schkuhr.) Presl, Tent. Pterid. 79 (1836); Hook. Syn. Fil. 301 (1867).

Terrestrial or epiphytic in secondary forest, plantations and swamps; up to 1,000 ft. alt.

**Fr.G.:** Heudelot 808 (K). **S.L.:** Smeathmann (BM), Afzelius (BM), Barter (K); Newton T. S. Jones 356 (BM, NJ); York Pass T. S. Jones 318 (BM, NJ); Njala Deighton 2111 (BM, K, NJ); Mahnoo Mair (K); Regent Sc. Elliot 4104 (K). **Lib.:** Ganta Harley 27 (BM, K), 3 (K); Port Marshall Knudsen 5 (BM), Fraser 3 (BM); Grand Bassa Ansell (K). **Ghana:** Asuansi Box 2032 (BM); New Tafo Lovi 5 (BM); Mampong Vigne FH 4099 (K); Aburi Patterson (BM); Kumasi Vigne FH 4110 (K). **Togo:** Lome Warnecke 451 (BM, K); Misahöhe Mildbr. 7402 (K). **S.Nig.:** Lagos Dalz. 1292 (K), Fraser 14 (BM), 15 (BM), 16 (BM); Abeokuta Irving (K); Omo (formerly part of Shasha) F.R. Richards 3170 (BM), 3388 (BM), Ross 65 (BM), Jones & Onochie FHI 17512 (BM); R. Nun T. Vogel 48 (K); Onitsha Jones FHI 1127 (BM); Bonny Kalbreyer 232 (BM). **Br.Cam.:** Isobi Estate, Victoria Thorold 7 (BM, K); Tombei, Nyasaso Thorold 20 (K); 1922 lava flow, Victoria Rosevear 38/37 (BM). **F.Po:** Barter (BM), Mann (BM).

Also throughout the tropics.

Several species are in cultivation in W. Africa. They include *N. tuberosa* (Bory) Presl (Adams 206), which is similar to *N. undulata* but with subcoriaceous, persistent leaflets;



*N. hirsutula* (Forst.) Presl (*Fraser* 12) which is separable from *N. biserrata* mainly by its rufous pubescence; and *N. duffii* Moore (*Jones*) with rounded pinnules.

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## 2. *ARTHROPTERIS* J. Sm. — Copel. Gen. 91 (1947).

- 1 Terminal pinna similar to lateral pinnae; pinnae obliquely cuneate at base, upper auriculate, entire or crenate; stipes articulate at base *1. palisoti*  
Apex of frond pinnatifid without a distinct terminal pinna; lateral pinnae equally cuneate or truncate at base: 2
- 2 Pinnae crenate *2. cameroonensis*  
Pinnae pinnatifid: ----- 3
- 3 Sporangia 1–8 to each lobe; white dots present on the upper surface of the leaf; articulation usually above middle of stipe *3. orientalis*  
Sporangia 1 to each lobe; white dots wanting; articulation below the middle of stipe ----- 4. *monocarpa*

### 1. *Arthropteris palisoti* (Desv.) Alston in Bol. Soc. Brot., sér. 2A, 30 : 6 (1956).

Roux 2009: Accepted name

*Aspidium palisoti* Desv. in Mag. Ges. Naturf. Freunde Berl. 5 : 320 (1811).

*Arthropteris ramosum* P. Beauv. Fl. Oware 2 : 54, t. 91 (1821).

*Arthropteris sublobatum* Schum. in K. Danske Vidensk. Selsk. 4 : 235 (1829).

*Nephrolepis ramosa* (P. Beauv.) Moore Ind. Fil. 102 (1858); Hook. Syn. Fil. 301 (1867), partly.

*Arthropteris obliterated* of C. Chr. Ind. Fil. 62 (1905), excl. syn. R. Br.; Tard. in Mém. I.F.A.N. 28 : 158, t. 7, fig. 7 (1953); Ogata Ic. Fil. Jap. 1 : t. 5 (1928).

Scandent on trees up to about 25 ft. in forest.

**Iv.C.:** Adiopodoumé; Abbayes 211 (BM). **Ghana:** Puso Puso Ravine Box 3269 (BM); Aburi Hills Johnson 451 (K); Asuansi Box 2033 (BM); Akropong, Akwapim Irvine 2612 (K); Bompata Vigne FH 2718 (K). **S.Nig.:** Omo (formerly part of Shasha) F.R. Richards 3244 (BM), Ross 26 (BM), Jones & Onochie FHI 16696 (BM), 17156 (BM), 18978 (BM); Angiama Barter 2092 (K), 146 (K). **Br.Cam.:** Dicumby Kalbreyer 165 (BM); near Bopo, S. Bakundu F.R. Richards 4045 (BM, K); Tombel Thorold 16 (K); Likomba, Victoria Mildbr. 10577 (K). **F.Po:** Mann (BM), 246 (K), T. Vogel 193 (K); Carretera de Gran Carlos Guinea 651 (BM).

### 2. *Arthropteris cameroonensis* Alston in J. Bot. 77 : 287 (1929); Tard. l.c. 158, t. 7, fig. 6 (1953), partly, excl. Iv.C. plants.

Roux 2009: Accepted name

*Nephrodium punctulatum* Bak. in Hook. Syn. 261 (1867), not of Desv. (1827).

On rocks in the open, sea level; to 4,000 ft. alt.



**Br.Cam.:** Isobi to Bibundi Keay FHI 28654 (BM); near Victoria Rosevear 41/37 (BM); Cam. Mt. Mann (BM), 1395 (K), Johnston 137 (BM); Mopanya Kalbreyer 175 (BM). **F.Po:** Moka Adams 1083 (BM); Musola Guinea 1395 (BM).

3. *Arthropteris orientalis* (Gmel.) Posth. in Rec. Trav. Bot. Néerl. 21 : 218 (1924); Tard. l.c. 159, t. 7, fig. 11,12 (1953).

Roux 2009: Accepted name

*Polypodium orientale* Gmel. in Syst. Nat. 2 : 1312 (1791).

*Aspidium Thonningii* Schum. l.c. 229 (1829).

*Nephrodium albopunctatum* (Bory ex Willd.) Desv. in Mém. Soc. Linn. Par. 6 : 255 (1827); Hook. Syn. Fil. 264 (1867).

**Fr.G.:** (ex Tard.). **S.L.:** Leicester Mt. Barter (K); Kasokora to Bumban Deighton 1238 (K, NJ). **Lib.:** Monrovia Harley F.208 (BM, K); Wanau Harley F. 202 (BM). **Iv.C.:** Man Portères 1028 (P). **Ghana:** Ntrongang, Pra R. Box 2893 (BM); Akwapim Thonning (C); Begoro Adams 245 (BM); Mampong Scarp Adams & Akpabla GC 4534 (K); Bompata Vigne FH 2711 (K.); Kumasi Darko 648 (K). **N.Nig.:** Alekpo Elliott81 (K); Aiede, Kabba Prov. Elliott61 (K); Idah Barter 1738 (K). **S.Nig.:** Ondo Keay FHI 22557 (K); Idanre Brenan & Keay 3738 (BM, K), Jones FHI 20709 (BM), Richards 3847 (K); Owo Keay FHI 22449 (BM); Nanka, Awka Div. Keay FHI 22285 (BM); Aguku Thomas 586 (K); Oban Talbot (BM). **Br.Cam.:** Nyasoso Thorold 19 (BM, K); Tombel Thorold CP 7 (BM); Wum L., Bamenda Savory UCI 325 (BM). **F.Po:** Mann (BM, K); Musola Guinea 1135 (BM).

Tropical Africa generally. (Fig. 12.)

4. *Arthropteris monocarpa* (Cordem.) C.Ch. in Perrier Cat. Pl. Madag. Ptérid. 32 (1931); Tard. l.c. 160, t. 7, fig. 8, 9,10 (1953).

Roux 2009: Accepted name

*Nephrodium monocarpum* Cordem. PL Réunion 74 (1895).

*Dryopteris orientalis* of Sim F.S.A. t. 9 (1915), not of C.Ch.

On rocks and trees in shade; up to 6,500 ft. alt.

**Fr.G.:** (ex Tard.). **S.L.:** Bumban Glanville 437 (K, NJ); Sugar Loaf Mt. T. S. Jones 340 (BM, NJ); Picket Hill T. S. Jones 320 (BM); Loma Mts. Jaeger 1462 (K). **Lib.:** Gola Forest Bunting (BM); Gbeidin Harley F. 223 (BM); Bwidin Harley 223 (K); Bilimu Harley 177 (K). **Iv.C.** Mt. Tonkouï, Man Abbayes 569 (BM), 2151 (BM). **Ghana:** Puso Puso Ravine, Kibi Mts. Adams 408 (BM, K), Box 3270 (BM). **Br.Cam.** Cam. Mt. Maitland 1102 (K); Nyasoso Thorold 15 (BM, K); Nkambe, Bamenda Savory UCI 359 (BM). **F.Po:** Mann 344 (K); Moka to Ilache Adams 1060 (BM).

Tropical Africa and the Mascarene Islands generally.

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3. *OLEANDRA* Cav. — Sim F.S.A. 123; Copel Gen. 90 (1947).

1 Frond chartaceous, glabrous except when young, eglandular *1. distenta*  
Frond with thin texture, covered with stalked glands and long hairs -----2. *ejurana*

1. *Oleandra distenta* Kunze in Bot. Zeit. 9 : 347 (1851); Tard. in Mém. I.F.A.N. 28 : 156 (1953), incl. var. villosa.

Roux 2009: Accepted name

*Oleandra articulata* of Hook. Syn. Fil. 302 (1867) partly; of F.S.A. 124, t. 34, fig. 1 (1915); not of Presl.

*Oleandra articulata* var. *welwitschii* Bak. in Hook. Syn. Fil. 303 (1867).

*Oleandra distenta* var. *hirsuta* Tard. in Notulae Syst. 14 : 333 (1952).

*Oleandra neriiformis* Hook. Syn. Fil. 302 (1867), partly, not of Cav.

Epiphyte; especially on oil palms in forest; up to 4,500 ft. alt.

**Fr.G.:** Lola to Nzo Chev. 20981 (K). **S.L.:** Gbap, Mongoba, Bulom T. S. Jones 388 (NJ); Madonke, Newton Deighton 2663 (BM, K, NJ); Makump Deighton 1321 (K, NJ); Mucale, Sherbro Isl. Hunter 5 (BM); Boma, Pukumu Krum Jackson 27 (K); Konno Dawe 538 (K). **Lib.:** Du R. Linder 110 (K); Gletown Baldwin 6908 (K.); Ganta Harley 10 (K). **iv.C.:** Bingerville Plateau Portères 1995 (ex Tard. as var. villosa); Mt. Oroumba Boka Abbayes 415 (ex Tard.); Mt. Tonkoui Portères, Abbayes 556 (ex Tard ) **Ghana:** Asuansi Box 2066 (BM); Puso Puso Ravine Box 3271 (BM); Atewa Range, Kibi Hills Box 3502 (BM, K); Pra-Anum F.R. Box 2927 (BM); scarp near Begoro Box 3447 (BM). **Togo:** Amedzofe Scholes 69 (BM). **S.Nig.:** Omo (formerly part of Shasha) F.R. Ross 268 (BM); Idanre Hills Keay FHI 22672 (BM); Degema Dist. Talbot (BM); Calabar Richards 3967 (BM, K). **Br.Cam.:** Mopanya Kalbreyer 143(BM,K); Cam. Mt. Adams 1231 (BM). **F.Po:** Mann (K), Barter (K).

Tropical and S. Africa generally, and in Mascarenes.

2. *Oleandra ejurana* Adams in Ann. Mag. Nat. Hist. ser. 12, 7 : 873, t. 28 (1954).

Roux 2009: Accepted name

At about 1,000 ft. alt.

**Ghana:** Ejura Scarp, Mampong Adams GC 4561 (BM), Morton GC 9763 (BM).

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4. *DAVALLIA* Sm. — Sim F.S.A. 127 (1915); Copel. Gen. 87 (1947).

Epiphytic ferns with long–creeping rhizomes clothed with dense scales; fronds moderate in size with articulate stipes and broad, usually much–divided glabrous laminae; sori terminal on veins; indusium fixed at base and sides, flanked usually and exceeded by horn–like projections of the lamina.

*Davallia chaerophylloides* (Poir.) Steud. Nom. Bot. Pl. Crypt. 146 (1824); Sim F.S.A. 128, t. 37 (1915); Tard. in Mém. I.F.A.N. 28 : 61 (1953).

Roux 2009: Accepted name

*Trichomanes chaerophylloides* Poir. Encycl. Méth. Bot. 8: 80 (1808).

*Davallia vogelii* Hook. Sp. Fil. 1 : 168 t. 59B (1846); Tard. l.c. 61, t. 8, fig. 6, 7, 9 (1953).

*Davallia elegans* of Hook. Syn. Fil. 95 (1868), partly, not of Sw.

*Davallia* Tard. in Notulae Syst. 13 : 372, t.1, fig. 1, 2 (1948).

Deciduous epiphyte in fringing forest, on oil palms or transition woodland.

**Fr.G.:** Ziama Massif Schnell 2754; Mt. Nimba Schnell 1409; Doucanga Le Testu 1549 (all ex Tard.).  
**S.L.:** Ndilajula, Njala Deighton 706 (K, NJ); Kangama, Gorama Mende Deighton 5117 (NJ); Central Prov. Dawe 521 (K). **Lib.:** Gola Bunting 1 (BM); Wanau Harley F. 201 (BM); Ganta Harley 13 (K).  
**Iv.C.:** Mt. Oroumba Boka, Dimbokro Abbayes 407 (BM). **Ghana:** Asuansi Box 2065 (BM), 2479 (BM); Begoro Adams 434 (K); Kumasi Vigne FH 3049 (K); Jimira F.R. Andoh FH 4236 (K); Agogo Foote 102 (BM); Pra–Anum F.R. Box 2926 (BM). **Togo:** Amedzofe Scholes 44 (BM). **N.Nig.:** S. of Kabba Elliott 63 (K); Alekpo Elliott 83 (K). **S.Nig.:** Akpaka F.R. Onochie, Ladipo & Ibrahim FHI 21645 (BM); Aponmu Jones FHI 20206 (BM); Akure F.R. Jones FHI 19542 (BM); Omo (formerly part of Shasha) F.R., Boss 266 (BM). **Br.Cam.:** Metschum R. Bamenda Savory UCI 304 (BM). **F.Po.:** Barter 1465 (K), T. Vogel 106 (K).

Tropical and S. Africa and in Mascarenes.

## 22. ASPLENIACEAE

Epiphytic or terrestrial; rhizomes creeping or erect; scales clathrate, usually dark. Stipes never articulate to the rhizome, with 2 vascular strands at base which unite into a single 4-armed strand; rhachis grooved, with basiscopic edge of each leaflet decurrent on the edge of the groove. Fronds simple, pinnate or finely dissected, with free veins (in all W. African species). Sori elongate along and on one side of the veins, protected by a narrow indusium attached along the vein. Sporangia with rather long stalks, about 7-celled, sometimes with a single row of cells; annulus with 20–28 indurated cells. Spores monolete with perispore.

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*ASPLENIUM* Linn. — Sim F.S.A. 134 (1915); Copel. Gen. 163 (1947).

- 1 Ultimate lobes of frond with pinnate or flabellate venation and several sori:
  - 2 Ultimate lobes of frond each with a single sorus: -----49
- 2 Texture usually herbaceous (except Nos. 9 and 20); veins distant; pinnae entire or obtusely toothed: 3  
Texture usually subcoriaceous (except No. 33); veins close, usually flabellate; pinnae often acutely toothed:29
- 3 Fronds simple: 4  
Fronds divided: ----- 7
- 4 Rhizome erect, epiphytic; fronds subcoriaceous; not rooting at apex: 5  
Rhizome creeping, usually terrestrial; fronds membranaceous often rooting at apex 7. *variabile* var. *variabile*
- 5 Cells of scales thick-walled; fronds up to 8 cm. across 1. *africanum*  
Cells of scales thin-walled; fronds up to 4 cm. across: ----- 6
- 6 Base of stipe pale, thick, channelled above, not winged, often truncate; sori about 3 mm. apart, at an angle of 30 degrees; veins mostly 1-forked 2. *currori*  
Base of stipe dark, thin, scarcely channelled above, winged to base, gradually alternate; sori about 5 mm. apart, at an angle of 60 degrees; veins mostly 2-forked ----- 3. *subintegrum*
- 7 Fronds simply pinnate: 8  
Fronds bipinnate-tripinnate: -----26
- 8 Fronds gemmiferous at or near apex: 9  
Fronds not gemmiferous: -----18
- 9 Fronds with a terminal pinna: 10  
Fronds ending in a bud without a terminal pinna ----- 44. *vagans*
- 10 Bud at top of terminal pinna: 11  
Bud at base of terminal pinna: -----15
- 11 Apex acuminate with bud at tip: 12  
Apex emarginate, with bud in the sinus ----- 8. *emarginatum*
- 12 Fronds with a single large apical pinna, and 2–3 pairs of detached, sub-opposite, oblong, adnate lobes below 4. *isabelense*  
Fronds with stipitate lateral pinnae: -----13

- 13 Rhachis scaly; pinnae oblong, abruptly acuminate; terminal pinna longer than lateral pinnae *5. annetii*  
Rhachis subglabrous: -----14
- 14 Terminal pinna longer than lateral pinnae, long-caudate; sori nearer to the margin than the midrib; frond glaucous *6. longicauda*  
Terminal pinna not much longer than lateral pinnae, acuminate; sori not nearer to margin than midrib; frond dark green -----7a. *variable* var. *paucijugum*
- 15 Rhachis winged; terminal pinna linear, serrate; pinnae subcoriaceous, oblong, obtuse or acuminate, crenate; rhizome stout, suberect; scales black *9. barteri*  
Rhachis not winged: -----16
- 16 Sori long, occupying 2/3 of the area between the costa and the margin: 17  
Sori short, occupying less than 1/2 the area between the costa and the margin; terminal pinna lanceolate, crenate, up to 12.5 cm. long; scales dark brown with a paler border -----12. *geppii*
- 17 Terminal pinna pinnatifid; lateral pinnae auricled on the upper side; oblong, obtuse, crenate, up to 5.6 cm. long; scales brown *10. macrophlebium*  
Terminal pinnae lanceolate, entire; lateral pinnae, not auricled, obliquely lanceolate, acuminate, entire, up to 15 cm. long; scales dark grey -----11. *gemmiferum*
- 18 Rhizome wide-creeping, stipes black and shiny; pinnae narrowly oblong, dimidiate; tips pinnatifid without a terminal pinna *13. unilaterale*  
Rhizome erect: -----19
- 19 Pinnae 10–15 cm. long, distinctly stipitate with petiolule 6 mm. long; rhachis not winged: 20  
Pinnae up to 6.3 cm. long, subsessile or with petiolule not more than 1 mm. long, dimidiate: -----21
- 20 Sori short; scales brown *12. geppii*  
Sori long; scales dark grey -----11. *gemmiferum*
- 21 Rhachis narrowly winged, not shining; sori divaricate: 22  
Rhachis not winged, black and shining; sori only 1–2 to each pinna, parallel to the margin ----18. *monanthes*
- 22 Sori long, occupying nearly the whole area between the costa and the margin; spores spiny; terminal pinna present, often with 1 of 2 basal lobes *14. diplazisorum*  
Sori short, occupying about 1/2 the area between the costa and the margin; spores with hyaline ridges; apex of frond pinnatifid: -----23
- 23 Fronds scarcely decrescent; lowest pinnae oblong: 24  
Fronds strongly decrescent; about 40 pairs of pinnae, lowest deltoid, pinnae up to 7.5 cm. long; scales clathrate *17. quintasii*
- 24 About 14 pairs of pinnae; pinnae up to 6 cm. long; scales with a central line of dark cells; spores 0.04 mm. long *15. inaequilaterale*  
About 20 pairs of pinnae; pinnae up to 2 cm. long; scales clathrate; spores 0.03 mm. long ----16. *suppositum*
- 26 Stipes shining; fronds tripinnate; ultimate segments with 2–3 obtuse lobes *19. abyssinica*  
Stipes not shiny; fronds bipinnate; ultimate segments toothed: -----27
- 27 Fronds not decrescent; stipe one-third length of lamina; leaflets cuneate at base, obtusely toothed *20. cuneatum*  
Fronds decrescent; stipes short: -----28

- 28 Scales small, dark, hair-pointed, absent from rhachis in mature fronds; leaflet broad at base, obtusely toothed *21. schnellii*  
Scales large, grey, not hair-pointed, covering rhachis; leaflets cuneate, sharply toothed ----- *22. brausei*
- 29 Veins invisible; pinnae numerous, small; fronds narrow rhachis black, shining: **30**  
Veins conspicuous; pinnae up to 20 each side, usually about 6; fronds ovate to lanceolate in outline: ----- **31**
- 30 Fronds about 15 cm. long, not gemmiferous *23. formosum*  
Fronds about 60 cm. long, gemmiferous ----- *24. protensum*
- 31 Fronds simply pinnate; pinnae subentire or cut less than half way to the midrib: **32**  
Fronds bipinnatifid with pinnae cut beyond the middle to tripinnate: ----- **41**
- 32 Pinnae lanceolate, about 6 times as long as broad; spores spiny: **33**  
Pinnae subtrapezoid or flabellate; less than 4 times as long as broad; spores crested with anastomosing ridges: ----- **34**
- 33 Sori divergent; pinnae sharply serrate, broadest in the middle; terminal pinna similar to lateral pinnae or 3-lobed *25. bialanum*  
Sori subcostal; pinnae doubly serrate, broadest near the base; terminal pinna pinnatifid ----- *26. friesiorum*
- 34 Pinnae flabellate, like the leaves of a *Ginkgo* *27. laurentii*  
Pinnae subtrapezoid; more or less acuminate: ----- **35**
- 35 Pinnae lacerate, acuminate, less than twice as long as broad (except the acumen); not gemmiferous: **36**  
Pinnae irregularly toothed, about 4 times as long as broad: ----- **37**
- 36 Rhizome creeping; rhachis not shining; pinnae shortly-acuminate, cuneate at base *28. jaundeense*  
Rhizome erect; rhachis somewhat shining; pinnae long-acuminate, truncate at base ----- *29. megalura*
- 37 Rhachis not gemmiferous: **38**  
Rhachis gemmiferous; texture herbaceous ----- *34. gemmascens*
- 38 Pinnae with lower side cut away at base: **39**  
Pinnae subequal at base; costa distinct; texture subcoriaceous; rhizome suberect; scales about 7 mm., clathrate ----- *33. subaequilaterale*
- 39 Scales opaque: ----- **40**  
Scales translucent, 3 mm. long; costa distinct to apex ----- *32. cancellatum*
- 40 Scales 6 mm. long, blackish; costa flabellately branched; texture subcoriaceous; sori extending to margin; spores irregularly reticulate *30. hemitomum*  
Scales 3 mm. long, brownish; costa distinct to apex, often raised and veins dark; texture herbaceous; sori not reaching the margin; spores crested ----- *31. warneckeii*
- 41 Stipes not abruptly swollen, dark to the base; fronds often more or less scaly beneath and on the rhachis; indusium membranaceous: **42**  
Stipes with an abruptly swollen green base; fronds not scaly beneath or on the rhachis; indusium subcoriaceous *43. adiantum-nigrum*
- 42 Rhachis not gemmiferous: **43**  
Rhachis gemmiferous; rhizome short-creeping and ascending; fronds bipinnate; pinnules cuneate at base and apex, with acute rather distant teeth; spores with reticulately

- anastomosing wing-like crests *42. blastophorum*
- 43 Rhizome erect or short-creeping: 44  
Rhizome wide-creeping: -----47
- 44 Fronds bipinnate, scales hair-pointed: 45  
Fronds bipinnatifid; scales with thin-walled translucent cells: -----46
- 45 All cells of scales translucent; rhachis not scaly *35. aemilii-guineae*  
Cells near apex of scales opaque; rhachis with deciduous scales *36. aethiopicum*
- 46 Scales shortly hair-pointed, metallic grey with uniform coloration *37. adamsii*  
Scales cucullate, brownish grey with paler margins *38. lividum*
- 47 Pinnae deeply pinnatifid; rhachis not scaly *39. stuhlmannii*  
Pinnae bipinnate, or pinnatifid almost to the costa; rhachis scaly: -----48
- 48 Rhachis with scattered grey scales; pinnules subulate with acutely toothed apex;  
rhizome scales large with small cells, long-acuminate *40. uhligii*  
Rhachis with many black deciduous scales; pinnules cuneate at base with closely  
and sharply serrate rounded apex *41. buettneri*
- 49 Fronds simply pinnate *18. monanthes*  
Fronds bipinnatifid or bipinnate: -----50
- 50 Fronds bipinnatifid; spores spinose: 52  
Fronds bipinnate to quadripinnatifid: -----54
- 52 Pinnae palmately lobed half way to costa; fronds gemmiferous at apex; scales  
ovate-lanceolate, thin-walled *44. vagans*  
Pinnae lobed more than half way to costa: -----53
- 53 Segments often fertile almost to the apex, often falcate; apices subacute; base of  
pinnae unequal *45. dregeanum*  
Segments with sterile obtuse or emarginate apex, not falcate; base of pinnae  
almost equal; scales ovate-lanceolate, brown marginal cells very thin, cells at apex thin-  
walled *46. preussii*
- 54 Fronds bipinnate; scales ovate with deflexed laciniae: 55  
Fronds quadripinnatifid; scales thin-walled, translucent, lanceolate, hair-pointed,  
about 1.2 cm. long; spores with wing-like crests *49. hypomelas*
- 55 Fronds herbaceous; stoloniferous, with creeping green stolons giving rise to small  
plants; spores spinose; indusium free at the ends *47. mannii*  
Fronds coriaceous; not stoloniferous; rhizome stout, erect; spores not spinose;  
indusium united to the leaf-tissue at both ends *48. cornutum*

1. *Asplenium africanum* Desv. in Mag. Ges. Naturf. Freunde Berl. 5 : 322 (1811); Tard.  
In Mém I.F.A.N. 28 : 171, t. 82, fig. 1, 2 (1953).

Roux 2009: Accepted name

*Asplenium sinuatum* P. Beauv. Fl. Oware 2 : 33, t. 79 (1816); Hook. Fil. Exot. t. 61  
(1858); Syn. Fil. 192 (1867), not of Salisb. (1796).

*Asplenium guineense* Schum. in K. Danske Vidensk. Selsk. 4 : 232 (1829).

*Asplenium venosum* Hook. Spec. Fil. 3 : 83 (1860).

On trees in forest; up to 600 ft. alt.

**Fr.G.:** (ex Tard.). **S.L.:** ex Hb. Moore (BM), Don (K), Whitfield (K); Blama, Pujehun Deighton 302 (K. NJ). **Lib.:** Linder 58 (K); Ganta Harley 29 (K). **Iv.C.:** (ex Tard.). **Ghana:** Simpa Vigne FH 2914 (K), Cummins 61 (K); Asuansi Box 2072 (BM), 2882 (BM); Kakum F.R. Box 2939 (BM); Akwapim Thonning (C). **S.Nig.:** Warri Beauvois (BM); Omo (formerly part of Shasha) F.R. Ross 75 (BM), Richards 3185 (BM), Jones & Onochie FHI 17223 (BM); Onitsha Barter 1739 (K). **F.Po.:** Clarence Peak Vogel 129 (Z); Laka Thorold 29 (BM), 31 (BM).

Also south to Angola.

2. *Asplenium currorii* Hook. Sp. Fil. 3 : 82 (1860); Syn. Fil. 192 (1867).

Roux 2009: Accepted name

*Asplenium africanum* var. *currorii* (Hook.) Tard. l.c. 172 (1953).

On trees or rocks in forest; at low levels up to 2,000 ft. alt.

**Fr.G.:** (ex Tard.). **Iv.C.:** Dana Massif Schell 1291 (ex Tard.). **Ghana:** Foso–Juaso F.R. Box 2070 (BM); Jamasi Adams & Akpabla GC 4529 (BM, K); Aburi Johnson 206 (K), Darko MDA 3 (K). **Togo:** Boem Mischlich (BM). **S.Nig.:** Idanre Richards 3826 (BM, K). **Br.Cam.:** Nyasaso Road, Tombel Thorold 11 (BM, K).

Also in S. Tomé, Principe and south to Angola (Gossweiler 9821).

3. *Asplenium subintegrum* C.Ch. Ind. Fil. 134 (1905); Tard. l.c. 174, t. 83, fig. 1, 2 (1953).

Roux 2009: Accepted name

*Asplenium coriaceum* Bak. in Hook. Syn. Fil. 192 (1868), not of Bory (1833).

**Br.Cam.:** Dicumby, Mopanya Kalbreyer 167 (BM, K); Cam. Mt. Mann 1387 (K); Johann–Albrechtshöhe Staudt 454 (K).

South to the Congo (Callens 2230).

4. *Asplenium isabelense* Brause In Engl. Bot. Jahrb. 53 : 383 (1915).

Roux 2009: Accepted name

Epiphyte, in forest; 2,500 to 3,200 ft. alt.

**F.Po.:** St. Isabel Peak Mildbr. 6413 (B, P).

5. *Asplenium annetii* (Jeanp.) Alston in Bol. R. Soc. Espan. Hist. Nat. 49 : 198 (1951); Tard. in Notulae Syst 14 : 358 (1952); in Mém. I.F.A.N. 28 : 178 (1953).

Roux 2009: Accepted name

*Diplazium annetii* Jeanp. in Bull. Soc. Bot. Fr 68 : 326 (1921).

On trees in forest; at about 8,000 ft. alt.



**F.Po:** Mann 445 (K); Musola Guinea 1139 (BM); St. Isabel Peak Adams 1130 (BM).

Also in French Cameroons.

6. *Asplenium longicauda* Hook. Sec. Cent. t. 69 (1861); Syn. Fil. 200 (1867); Tard. in Mém. I.F.A.N. 28 : 177, t. 33, fig. 3 (1953).

Roux 2009: Accepted name

On trees in forest; about 3,000 ft. alt.

**Br.Cam.:** Mamfe Rosevear (BM); Cam. Mt. Annet 93 (ex Tard.). **F.Po:** St. Isabel Peak Mann 341 (K).

Also in Principe and French Cameroons.

7. *Asplenium variabile* Hook. var. *variabile* — Spec. Fil. 3 : 93, t. 185 (1860); Syn. Fil. 194 (1867); Tard. l.c 174, t. 32, fig. 3, 4 (1953).

Roux 2009: Synonym of *Asplenium variabile* Hook.

*Asplenium repandum* Mett. ex Kuhn Fil. Afr. 114 (1868); Syn. Fil. 482 (1874).

*Asplenium efulense* Bak. in Kew Bull. 1901 : 137.

*Asplenium dusenii* Luer. ex Bonap. Notes Ptérid. 14 : 276 (1924), name only.

On rocks in streams under forest shade.

**Fr.G.:** (ex Tard.). **S.L.:** Don (BM); Kolu Yeyei Hills, Pendembu Dawe 548 (BM, K, NJ). **Lib.:** Bilimu Harley 176 (BM, K); S. of Kitomu Harley 153 (BM); N. of Beidin Harley 151 (BM); Gbeidin Harley 221 (BM); Peahtah Linder 958 (K); Diebla, Webo Dist. Baldwin 6316 (K). **Iv.C.:** Mt. Oroumba Boka Abbayes 436 (BM). **Ghana:** Asuansi Box 2084 (BM), 2085 (BM), 2433 (BM); N.E. of Bosuso Box 2942 (BM); Bunsu Box 3468 (BM); Puso Puso Adams 333 (BM), 411 (BM, K); Midialoma, Axim Cudjoe 69 (BM); Amentia Irvine 461 (K). **S.Nig.:** Omo (formerly part of Shasha) F.R. Jones & Onochie FHI 17565 (BM), Keay FHI 16087 (BM), Ross 206 (BM), 182 (BM), 244 (BM); Okomu F.R. Richards 3880 (BM, K), 3645 (BM, K). **Br.Cam.:** Mamfe Savory 634 (BM); Ekundu N'dene Dusen (BM). **F.Po:** Barter (K), 2047 (K), Mann 1239 (K); Mt. Balea Guinea 393 (BM).

Also in Principe and south to Belgian Congo.

7a. *Asplenium variabile* var. *paucijugum* (Ballard) Alston in Bol. Soc. Brot., sér. 2A, 30 : 7 (1956).

Roux 2009: Synonym of *Asplenium variabile* Hook.

*Asplenium paucijugum* Ballard in Hook. Ic. Pl. 33 : t. 3287 (1935); Tard. l.c. 176, t. 32, fig. 7, 8 (1953).

*Asplenium akimense* Adams in Ann. & Mag. Nat. Hist. ser. 12, 7 : 873, t. 29 (1954).

On rocks in stream, rarely on trees; in forest at low levels.

**Fr.G.:** Lola to Nzo Chev. 20994 (ex Ballard); Timbikounda to Farakoro Chev. 20627 (ex Ballard); Kouria Caille 14714 (ex Ballard), 14715 (ex Ballard). **S.L.:** Bandakaifaia, R. Doro Jaeger 1881 (K); Lumbaraya Sc. Elliot 4988 (K). **Lib.:** Beidin Harley 220 (BM); Bill Harley 217 (BM); Bilimu Harley 2097 (BM). **Iv.C.:** (ex Tard.). **Ghana:** Asuansi Box 2036 (BM), 2095 (BM); Neung F.R., Agona Cudjoe 22 (BM, K); Puso Puso Ravine Box 3261 (BM); Bompata Vigne FH 2712 (K). **Br.Cam.** Mamfe

Rosevear (BM); Buea Adams 1247 (BM); Mopanya Kalbreyer 169 (BM), 178 (BM); Dicumby Kalbreyer 168 (BM). **F.Po.**: Boloko de San Carlos Guinea 531 (BM); St. Isabel Peak Adams 3018 (K). Also south to Spanish Guinea.

[*A. akimense* Adams from Akim (*Cudjoe* Ghana 3829) is intermediate between *A. variabile* and *A. paucijugum*]

8. *Asplenium emarginatum* P. Beauv. Fl. Oware 2 : 6, t. 61 (1808); Hook. Sec. Cent. t. 80 (1861); Syn. Fil. 200 (1867); Tard. l.c. 177, t. 32, fig. 5, 6 (1953).

Roux 2009: Accepted name

Terrestrial or on stumps in forests; up to 4,500 ft. alt.

**Fr.G.:** (ex Tard.). **Iv.C.:** Adiopodoumé Abbayes 311 (BM), 163 (BM); road to Tonkoui Abbayes 595 (BM). **Ghana:** Mampong Scarp Box 2089 (BM), 3275 (BM); Nsawam–Aburi Road Box 2878 (BM) Pra–Anum F.R. Box 2928 (BM); Volta River F.R. Adams 373 (BM); Peji Hill, Anum Adams 141 (K). **Togo:** (ex Tard.). **N.Nig.:** Omewo Elliott (K). **S.Nig.:** R. Ogun below Ogbomtosa, Ijaiye F.R. Keay FHI 21175 (BM); Onitsha Barter 1735 (K). **Br.Cam.:** above Buea Migeod 140 (BM). **F.Po.:** Mann 343 (K). Also in Principe, S. Tomé and south to Angola and east to Uganda.

9. *Asplenium barteri* Hook. Sec. Cent. 2 : t. 75 (1861); Tard. l.c. 180, t. 34, fig. 2 (1953).

Roux 2009: Accepted name

*Asplenium sherburgense* Bak. in Ann. Bot. 5 : 304(1891).

*Asplenium barteri* var. *acuta* Hieron. in Engl. Bot. Jahrb. 46 : 355(1911).

*Asplenium erectum* of Hook. Syn. Fil. 202 (1867), partly, not of Bory.

On trees and wet rocks on lower hills.

**Fr.G.:** between Gouée Bridge and Nzo Abbayes 615 (BM). **S.L.:** Don (BM); Sugar Loaf Mt. Barter (K); Koyema, Kuniki Sarda Road Glanville 2432 (K, NJ); Makumbe, Kuniki Sarda Deighton 4067 (NJ); Sherbro Isl. Mair (K). **Lib.:** Kitomu Baldwin 13140 (BM); Du R. Linder 85 (K); Gere, Gola Forest Bunting (BM); Ganta Harley 25 (K); Bobei, Sanokwele Baldwin 9628 (K); Nyandamolahun, Mao R. Bequaert 74 (K). **Iv.C.:** Agnéby to Bia Rousseau (K). **Ghana:** Simpa Vigne FH 2913 (K); Begoro Johnson 621 (K), Box 3449 (BM); Atewa Range F.R. Box 3504 (BM); Puso Puso Ravine Adams 508 (BM), 3854 (K); Brofoyedru, Mansi Hills Cummins 36 (K). **Nig.:** Usonigbe F.R., Miekle & Keay 25566 (BM); Okomu F.R. Richards 3601 (BM, K). 3673 (BM, K); Aboh Barter 1454 (K); Afi River F.R. Jones & Onochie FHI 18625 (BM). **Br.Cam.:** Victoria Kalbreyer 199 (BM, K); Debundscha Box 3619 (BM), Thorold 4 (BM, K); Johann–Albrechtshöhe De Gironcourt 406 (K). **F.Po.:** Mann (K); Laka Thorold 32 (BM); Clarence Peak T. Vogel 188 (K). Also south to Congo.

10. *Asplenium macrophlebium* Bak. Syn. Fil. 485 (1874); in Hook. Ic. Pl. 17 : t.1646 (1886); Tard. in Mém. I.F.A.N. 28 : 180, t. 34, fig. 3 (1953).

Roux 2009: Accepted name

**Fr.G.:** La Loffa, Macenta Adam 3305 (P). **Iv.C.:** Sakonanta to Sampleu Chev. 21097 bis (P). **Br.Cam.:** Mopanya Kalbreyer 151 (BM, K); between Nkan and Wum F.R. Savory UCI. 320 (BM). **F.Po.:** Mann 338 (K).

Also in eastern Africa from the Sudan (Andrews 1792) to Tanganyika (Bruce 81).

11. *Asplenium gemmiferum* Schrad. in Gött. gel. Anz. 1818 : 916; Hook. Syn. Fil. 207 (1867); Sim F.S.A. 154, t. 57, fig. 1 (1915).

Roux 2009: Accepted name

Epiphyte at 4,000–5,000 ft. alt.

**Br.Cam.:** above Buea Migeod 225 (BM), 82 (BM); Cam. Mt. Mann 1394 (K). **F.Po:** Moka Adams 1034 (BM).

Also in E. and S. Africa.

12. *Asplenium geppii* Carruth. Cat. Welw. 2 : 269 (1901); Tard. l.c. 178 (1953).

Roux 2009: Synonym of *Asplenium anisophyllum* Kunze

*Asplenium anisophyllum* of Hook. Syn. Fil. 204 (1867), partly, not of Kunze.

On trees in forest; up to 7,500 ft. alt.

**Fr.G.:** (ex Tard.). **S.L.:** Loma Mts. Jaeger 412 (BM, NJ), 1585 (K); Konnoh Country Burbidge 502 (K). **Lib.:** Bilimu Harley 172 (BM); Bili Harley 172 (K). **Iv.C.:** Mt. Oroumba Boka Abbayes 432 (BM), 2199 (BM). **Ghana:** Begoro Adams 452 (BM, K). **S.Nig.:** Ikvette, Obudu Div. Savory A Keay FHI 25250 (BM). **Br.Cam.:** Cam. Mt. Adams 1236 (BM), Mann 2055 (K), 1404 (K), Johnston (K), Dunlap 231 (K), 121 (K), Rosevear RF/38 (BM), FR/43 (BM), Box 3602 (BM); Mann's Spring Kalbreyer 136 (BM); Mopanya Kalbreyer 151 (K); Bamenda Migeod 388 (BM, K); Nkambe, Bamenda Savory UCI 372 (BM). **F.Po:** Mann (K); Finca Puente Guinea 1671 (BM); near Moka L. Adams 1114 (BM); near L. Loretto Adams 1009 (BM, K).

Also south to Angola.

13. *Asplenium unilaterale* Lam. Encycl. Méth. Bot. 2 : 305 (1786); Tard. l.c. 182, t. 37, fig. 1, 2 (1953).

Roux 2009: Accepted name

*Asplenium resectum* Sm. Icon. Ined. 3 : t. 72 (1791); Hook. & Grev. Ic. Fil. t. 114 (1828); Hook. Syn. Fil. 210 (1867).

On wet rocks by streams and on wet banks, sometimes epiphytic; in forest up to 6,000 ft. alt.

**Fr.G.:** Nimba Mts. Adam 3078, Schnell 1418, 1863, 2858; Alammata Adam 5450 (all ex Tard.). **Iv.C.:** Mt. Oroumba Boka Abbayes 447 (BM); foot of Noubu Mts. Chev. 21111 (K). **Ghana:** S. Fomang Su F.R. Box 3460 (BM); Puso Puso Ravine Box 3463 (BM), 3268 (BM), Adams 326 (K); Ntronang, Pra R. Box 2894 (BM); Kibi Johnson 260 (K). **S.Nig.:** Omo F.R. Jones & Onochie FHI 17557 (BM); below Mt. Koloishe, Obudu Div. Savory & Keay 25038 (BM). **Br.Cam.:** Cam. Mt. Savory 561 (BM), Mann 1383 (K); below Liwonge, Mann's Spring Richards 4310 (BM, K); Mopanya Kalbreyer 149 (BM), 179 (K); Johann-Albrechtshöhe Staudt 467 (BM, K); Bakebe Hill, Mamfe Savory 562 (BM); Metschum Falls, Bamenda Savory UCI 301 (BM). **F.Po:** Mann (BM, K), 134 (K), 369 (K), Barter 2053, (K); Finca Puente Guinea 4804 (BM, K); L. Loretto Adams 1022 (K).

Also in other parts of tropical Africa, and in tropical Asia.

14. *Asplenium diplazisorum* Hieron. in Engl. Bot. Jahrb. 46 : 351 (1911); Tard. l.c. 179, t. 34, fig. 1 (1953).

Roux 2009: Accepted name

On ground, rocks and rotten wood in forest; up to at least 3,200 ft. alt.

**S.L.:** Bintumane T. S. Jones (BM, NJ). **Lib.:** Bilimu Harley 101 (BM). **iv.C.:** Mt. Oroumba Boka Abbayes 437 (P). **Ghana:** Puso Puso Ravine Box 3260 (BM); Akrum Waterfall, Begoro Box 2950, partly (BM); Bunso Thompson (BM).

Also south to French Congo.

15. *Asplenium inaequilaterale* Willd. Sp. Pl. 5 : 322 (1810); Hieron. in Hedwigia 61 : 22 (1919); Tard. l.c. 184, t. 34. Fig. 4, 5 (1953).

Roux 2009: Accepted name

Terrestrial near streams; at 3,000–4,000 ft. alt.

**Fr.G.:** (ex Tard.). **F.Po:** Mann (K); Moka Adams 1035 (BM); near L. Loretto Adams 1023 (BM, K). Widespread in tropical Africa and the Mascarene Islands.

16. *Asplenium suppositum* Hieron. in Engl. Bot. Jahrb. 46 : 353 (1911).

Roux 2009: Synonym of *Asplenium inaequilaterale* Bory ex Willd.

**Ghana:** scarp near Begoro Box 3448 (BM, K). **Togo:** Amedzofe Irvine 3347 (ex Adams); Kpeme Hill, N. of Kpandu, 2,000 ft. Adams 1808 (BM).

Widespread in tropical Africa.

17. *Asplenium quintasii* Gandoger in Bull. Soc. Bot. Fr. 66 : 305 (1919); Tard. l.c. 184, t. 37, fig. 7, 8 (1953).

Roux 2009: Synonym of *Asplenium erectum* Bory ex Willd.

*Asplenium erectum* of Hook. Syn. Fil. 202 (1867), partly, not of Sw.

Epiphyte or terrestrial; up to about 7,000 ft. alt.

**Fr.G.:** Nimba Mts. Schnell 412, Portères (both ex Tard.). **Br.Cam.:** Cam. Mt. Johnston 133 (BM), Savory 566 (BM), Dunlap 232 (K), Mann 2045 (K), 1379 (K), Box 3605 (BM), Rosevear RF/44 (BM); Mann's Spring Steele 98 (K); Mopanya Kalbreyer 177 (BM). **F.Po:** Mann 450 (K), 362 (K); Moka Adams 1036 (BM), 2997 (K); St. Isabel Peak Guinea 2976 (BM, K).

Also in S. Tomé.

18. *Asplenium monanthes* Linn. Mant. Pl. 1 : 130 (1767); Maxton in Contr. U.S. Nat. Herb. 17 : 150, t. 1 (1913); Sim F.S.A. 141, t. 46, fig. 1 (1915).

Roux 2009: Accepted name

*Asplenium monanthemum* Linn. f. ex Murray Syst. Veg. 933 (1784); Lowe Ferns Brit. Exot. 5 : 3, t. 1A (1872).

*Asplenium dentex* von Buch Beschr. Canar. Ins. 189 (1825).

At 8,000 ft. alt.

**F.Po:** Clarence Peak Mann 667 (K).

Widespread In E. Africa, from the Sudan to Cape Province, Madeira and Madagascar and from Mexico to Chile and in Tristan, Jamaica and Hawaii.

19. *Asplenium abyssinicum* Fée Gen. Fil. 199 (1852); Sim F.S.A. 165, t. 70 (1915).

Roux 2009: Accepted name

*Asplenium gracillimum* Kuhn in Engl. Hochgebirgsfl. 103 (1892), not of Col. (1890).

*Asplenium kuhnianum* C.Ch. Ind. Fil. 117 (1906); Tard. in Mém. I.F.A.N. 28 : 196, t. 38, fig. 6 (1953).

*Asplenium ducis-aprutii* Pirotta in Ann. di Bot. 7 : 173 (1908).

*A cicutarium* var. *abyssinicum* (Fée) Hook. Syn. Fil. 220 (1867).

Terrestrial in forest; 3,000 to 9,100 ft. alt.

**Br.Cam.:** Cam. Mt. Kalbreyer 111 (BM), Johnston 128 (BM), Keay FHI 28603 (BM), Adams 1282 (BM), Maitland 1047 (K), Mann 2046 (K), 1376 (K), Dunlap 233 (K), 234 (K), Mildbr. 10868 (K); Mann's Spring Richards 4242 (BM, K), 4215 (K), 4247 (BM, K.); L. Oku, Bamenda Savory UCI 459 (BM); Nkambe Savory UCI 362 (BM). **F.Po:** Mann (BM, K), 375 (K); St. Isabel Peak Guinea 2994 (BM), Adams 1167 (BM).

Also in French Cameroons (Bambuto Mts.) and the mountains of eastern and southern Africa.

20. *Asplenium cuneatum* Lam. Encycl. Méth. Bot. 2 : 309 (1786); Hook. Syn. Fil 214 (1867); Tard l.c. 196 (1953).

Roux 2009: Accepted name

Epiphyte.

**Ghana:** Akrum R., Begoro Adams 457 (BM, K); Puso Puso Adams 330 (BM).

Also in S. Tomé, Congo, Comoro Islands.

21. *Asplenium shnellii* Tard. in Notulae Syst. 13 : 370, t. 1, fig. 5, 6 (1948).

Roux 2009: Accepted name

*Asplenium nigritianum* of Tard. in Mém. I.F.A.N. 28 : 196 (1953), partly.

**Fr.G.:** Nimba Mts. Schnell 450 (P), 3678 (P).

22. *Asplenium brausei* Hieron. in Engl. Bot. Jahrb. 46 : 359 (1911).

Roux 2009: Accepted name

*Asplenium nigritianum* of Tard. l.c. 196 (1953), partly.

On rocks at base of cliff face with running water; at 3,000 ft. alt.

**Br.Cam.:** Bakebe Hill Savory 618 (BM).  
**Also in French Cameroons.**

23. *Asplenium formosum* Willd. Sp. Pl. 5 : 329 (1810; Hook. Fil. Exot. t.16 (1857); Syn. Fil. 210 (1867); Tard. l.c. 183, t. 37, fig. 3, 4 (1953).

Roux 2009: Accepted name

On rocks and trees at low levels in forest; up to 2,000 ft. alt.

**Fr.G.:** (ex Tard.). **S.L.:** Mt. Gonkwi, Dunnia Sc. Elliot 163 (BM), 4861 (K); Loma Mts. Jaeger 633 (K). **Lib.:** Bilimu Harley 173 (BM); Sanokwele Baldwin 9496a (K). **Iv.C.:** Man, road to Mt. Tonkoui Abbayes 592 (BM). **Ghana:** Abetifi Scholes 106 (BM); Agogo Foote 33 (BM). **Togo:** Amedzofe Irvine 3343 (K). **N.Nig.:** Patti Lokoja Dalz. 244 (K); S. of Kabba Elliott 64 (K). **S.Nig.:** Ondo Keay FHI 22556 (BM); Idanre Hills Keay & Onochie FHI 20248 (BM); Afi River F.R. Jones & Onochie FHI 18756 (BM). **Br.Cam.:** Bamenda Rosevear (BM); Metschum Falls, Bamenda Savory UCI 302 (BM).  
**Also in other parts of tropical Africa and in America, Ceylon and S. India.**

24. *Asplenium protensum* Schrad. in Gött. gel. Anz. 1818 : 916; Hook. Syn. Fil. 211 (1867); Sim F.S.A. 149, t. 51 (1915); Tard. in Mém. I.F.A.N. 28 : 183, t. 38, fig. 5, 6 (1953).

Roux 2009: Accepted name

Epiphytic or rarely terrestrial, in montane forest; 5,600–8,000 ft. alt.

**Br.Cam.:** Cam. Mt. Mann 2043 (BM), Maitland 1052 (K), Annet 115 (ex Tard.); near Mann's Spring Richards 4250 (BM, K); Onyanga Steele 65a (K); Mopanya Kalbreyer 180 (K); Bambulue, Bamenda, Savory UCI 461 (BM). **F.Po:** Mann (K), 360 (K), 1403 (K), 2043 (K), Johnston 110 (K); St. Isabel Peak Guinea 2972 (BM).  
**Also in other parts of tropical Africa and the Mascarenes.**

25. *Asplenium biafranum* Alston & Ballard in Hook. Ic. Plant. t. 3367 (1938); Tard. l.c. 185, t. 35, fig. 1, 2 (1953). A. serra of Hook. Syn. Fil. 206 (1867), partly, not of Langsd. & Fisch.

Roux 2009: Accepted name

Epiphyte in forest.

**S.Nig.:** Ikweite, Obudu Div. Savory & Keay FHI 25265 (BM). **Br.Cam.:** above Buea Migeod 73 (K). **F.Po:** Mann (BM, K), 346 (K); Moka Adams 1124 (BM).  
**Also in French Cameroons and S. Tomé.**

26. *Asplenium friesiorum* C.Ch. in Notizbl. Bot. Gard. Berl. 9 : 181 (1924); Dansk. Bot. Ark. 7 : 99, t. 34, fig. 6 (1932); Ballard in Hook. Ic. Plant, t. 3366 (1938); Tard. l.c. 185, t. 35, fig. 3 (1953).

Roux 2009: Accepted name

*Asplenium monilisorum* Domin in Preslia 8 : 7 (1929).

*Asplenium pseudoserra* Domin l.c. 6.

*Asplenium serra* of Hook. Syn. Fil. 206 (1867), partly; Sim F.S.A. 154, t. 56 (1915); not of Langsd. & Fisch.

Epiphyte in forest; 7,000 8,000 ft. alt.

**Br.Cam.:** Cam. Mt. Mann 1402 (K), Johnston (BM), 108 (K), Cheesman (BM); Tongo Maitland 1055 (K); L. Oku, Bamenda Keay FHI 28484 (BM); Savory UCI 457 (BM); Onyanga Steele 65b (K).

Also in E. Africa and Madagascar.

27. *Asplenium laurentii* Bommer ex Christ in Bull. Herb. Boiss. 4 : 663 (1896); Engl. Pflanzenw. Afr. 2 : 29, fig. 25 (1908) in Tard. l.c. 174, t. 33, fig. 6 (1953); De Wild. Miss. Laurent. 2 : t. 4 (1905).

Roux 2009: Accepted name

*Asplenium ginkgo* Hieron. ex De Wild. l.c. 1 : 4 in syn.

**S.Nig.:** Degema Dist. Talbot (BM). **Br.Cam.:** Barombi Preuss 212 (ex Tard.).

Also south to the Congo and in Uganda (Sangster 36).

28. *Asplenium jaundeense* Hieron. in Engl. Bot. Jahrb. 46 : 369 (1911); Tard. Nickl. & Jac.–Fél. in Bull. Et. Cam. 2 : 85, t. 3, fig. 1 (1949); Tard. in Mém. I.F.A.N. 28 : 192, t. 36, fig. 4 (1953).

Roux 2009: Accepted name

*Asplenium dimidiatum* var. *zenkeri* Hieron. in Engl. Pflanzenw. Afr. 2 : 28, Fig. 24D (1908).

**Fr.G.:** Timouhou Schnell 1365 (P). **Br.Cam.:** Bakebe Hill, Mamfe Savory 621 partly (BM).

Also south to Gabon.

29. *Asplenium megalura* Hieron. ex Brause in Deutsch. Zentr.–Afr. Exp. 1907–8, 2 : 17 (1910); Tard. l.c. 190, t. 36, fig. 2 (1953).

Roux 2009: Accepted name

*Asplenium dimidiatum* var. *longicaudatum* Hieron. in Engl. Pflanzenw. Afr. 2 : 28, fig. 24C (1908).

Epiphyte, at 1,300 ft. alt.

**Fr.G.:** Macenta Adam 6131 (P); Nimba Mts. Schnell 414 (P). **S.L.:** Jaeger 1171 (K). **Lib.:** Kitomu Harley 210 (BM); Bilimu Harley 67 (K). **Iv.C.:** Man Portères (P); Mt. Momy Chev. 21383 (P); Gouro to Goudkangoumé Chev. 21401 (P), **Ghana:** Apapam, Kibi Adams 969 (BM). **Togo:** Amedzofe Irvine 3395 (ex Adams).

Also in E. Africa. (Fig. 13.)

30. *Asplenium hemitomum* Hieron. in Engl. Bot. Jahrb. 46 : 365 (1911); Tard. l.c. 189, t. 36, fig. 1 (1953).



Roux 2009: Accepted name

*Asplenium dimidiatum* of Hook. Syn. Fil. 209 (1867), partly, not of Sw.

*Asplenium* Tard. in Notulae Syst. 13 : 372 (1948).

On trees and rocks usually by streams in forest; up to 2,500 ft. alt.

**Fr.G.:** Macenta Schnell 2677 (P). **S.L.:** Ndilafula, Njala Deighton 707 (K, NJ); Mabonto–Bumban Deighton 1235 (K, NJ); Konnoh Country Burbidge 493 (K). **Lib.:** Bilimu Harley F. 184; Ganta Harley 24 (K); Wohmen Baldwin 10104 (K); Dobli Isl., St. Paul B. Bequaert 18 (K); Nekabozu Baldwin 9985a (K). **Iv.C.:** Dans Massif Schnell 1325 (P); Mt. Oroumba Boka Abbayes 431 (BM, P). **Ghana:** Kakum F.R., Box 2863 (BM); Begoro Adams 242 (BM), Irvine 1351 (K); Aburi Box 2087 (BM); Kwabia Vigne FH 4018 (K); Ofinso Cox 1 (K); Pra–Anum F.R. box 2922 (BM). **N.Nig.:** Idah Barter 1455 (K). **S.Nig.:** Oluasogo, Omo (formerly part of Shasha) F.B., Ross 230 (BM); Owena B. Jones FHI 19529 (BM); Orosun summit. Idanre Savory UCI 21 (BM); Onitsha Barter 1740 (K); R. Nun Mann (K); Old Calabar Holland 18 (K); Calabar Richards 3993 (BM, K); Oban Dist. Talbot (K). **Br.Cam.:** Nyasaso Thorold 13 (BM, K); Bakebe Hill, Mamfe Savory 621 partly (BM); Barombi Preuss 292 (BM); Johann–Albrechtshöhe Staudt 586 (K). **F.Po:** Mann (BM), 247 (K); St. Isabel Peak Guinea 2628 (BM).  
Also south to Belgian Congo.

31. *Asplenium warneckeii* Hieron. in Engl. Bot. Jahrb. 46 : 367 (1911).

Roux 2009: Accepted name

**Ghana:** near Akrum Waterfall, Begoro Box 2946 (BM).

Also in Tanganyika.

32. *Asplenium cancellatum* Alston in Bol. Soc. Brot., sér. 2A, 30 : 8 (1956).

Roux 2009: Accepted name

*Asplenium subaequilaterale* (Bak.) Hieron. in Engl. Bot. Jahrb. 46 : 360 (1911), partly, excl. syn. Bak.

**Ghana:** New Tafo Lovi 21 (BM). **Br.Cam.:** Nyasaso Thorold 13 (BM); Litoka Maitland 1094 (K); Barombi Preuss 198 (P).

Also in French Cameroons (Zenker 4116).

33. *Asplenium subaequilaterale* (Bak.) Hieron. in Engl. Bot. Jahrb. 46 : 360 (1911), partly; Tard. in Mém. I.F.A.N. 28 : 187, t. 35, fig. 6, 7 (1953), partly.

Roux 2009: Synonym of *Asplenium stuhlmannii* Hieron.

*Asplenium dimidiatum* var. *subaequilaterale* Bak. Syn. Fil. 486 (1874).

*Asplenium subhemitomum* Brause in Engl. Bot. Jahrb. 53 : 383 (1915).

**F.Po:** Mann 379 (K), 366 (K); St. Isabel Peak Mildbr. 6441 (B, BM, P).

34. *Asplenium gemmascens* Alston l.c. 10 (1956).

Roux 2009: Accepted name



**S.Nig.:** Ikwette–Baleghete path, Obudu Div. Savory & 5c Keay FHI 25201 (BM). **Br.Cam.:** Bakebe Hill, Mamfe Savory 622 (BM); Dicumby Kalbreyer (BM, K).

35. *Asplenium aemilii–guineae* Alston in Bol. Soc. Esp. Hist. Nat. 49 : 194, fig. 1 (1951).

Roux 2009: Synonym of *Asplenium aethiopicum* (Burm.f.) Bech. subsp. *aethiopicum*

**F.Po:** ascent of Serrano Peak, Moka Guinea 1950 (BM).

36. *Asplenium aethiopicum* (Burm.) Becherer in Candollea 6 : 22 (1935); Tard. in Mém I.F.A.N. 28 : 193, t. 38, fig. 1–3 (1953).

Roux 2009: Synonym of *Asplenium aethiopicum* (Burm.f.) Bech. subsp. *aethiopicum*

*Trichomanes aethiopicum* Burm. Fl. Cap. Prod, in Fl. Ind. 28 (1768).

*Asplenium furcatum* Thunb. Prod. Fl. Cap. 172 (1800); Hook. Syn. Fil. 214 (1867), partly.

*Asplenium praemosum* of C. Chr. Ind. Fil. 127 (1906), partly, ? of Sw.; Sim F.S.A. 163, t. 65 (1915).

On trees in forest; 3,000 to 7,000 ft. alt.

**Fr.G.:** (ex Tard.). **S.L.:** Jaeger 1175 (K). **N.Nig.:** Vom, Jos Plateau Dent Young 266 (K). **Br.Cam.:** Bamenda Rosevear (BM), Migeod 377 (BM, K), Savory UCI 369 (BM), 303 (BM), 330 (BM); Bakebe Hill Savory 629 (BM); Cam. Mt. Johnston 109 (BM), Kalbreyer 2066 (K), Cheesman (BM), Adams 1220 (BM), 1283 (BM), 1293 (BM), 1315 (BM); Mann's Spring Kalbreyer 110 (BM), 4216 (BM, K); Buea Rosevear 39 (BM). **F.Po:** Mann 357 (K); St. Isabel Peak Guinea 2854 (BM); Moka to Ilache Adams 1054 (BM); near L. Moka Adams 1109 (BM).

Widespread in tropical and S, Africa.

37. *Asplenium Adamsii* Alston in Bol. Soc. Brot. sér. 2A, 30 : 7 (1956).

Roux 2009: Accepted name

On rocks; 8,500 to 9,000 ft. alt.

**Br.Cam.:** Cam. Mt. Adams 1271, 1278, 1284 (all BM).

38. *Asplenium lividum* Mett. ex Kuhn in Linnaea 36 : 100 (1869); Bak. Syn. Fil. 486 (1874); Tard. in Mém. I.F.A.N. 28 : 195, t. 38, fig. 5 (1953).

Roux 2009: Accepted name

On trees in forest; 2,500 to 6,500 ft. alt.

**S.L.:** Bintumane T. S. Jones 8 (BM, NJ). **Br.Cam.:** Bakebe Hill Savory 631 (BM); Cam. Mt. Adams 1220a (BM), 1266 (BM), 1308 (BM).

Also in south tropical Africa, Venezuela and Colombia.

39. *Asplenium stuhlmannii* Hieron. in Engl. Pflanzenw. Ost–Afr. C: 83 (1895); Tard. l.c. 190, t. 36, fig. 3 (1953).

Roux 2009: Accepted name

*Asplenium amoenum* C. H. Wright in Johnst. Uganda Prot. 1 : 326 (1902), not of Presl (1836).

On rocks.

**Fr.G.:** Macenta Adam, 5513 (P); Guéckédou Adam 5581 (P). **S.L.:** Bumban Glanville 436/5 ? (BM, K, NJ). **Iv.C.:** Séguéla Abbayes 619 (BM); Mt. Sémélébou Chev. 22095 (P); Mt. Kouan Chev. 21269 (K, P); Mt. Dou, Man Portères (P). **S.Nig.:** Idanre Jones FHI 14846 (BM); Afi River F.R., Jones & Onochie FHI 18757 (BM).

Also in E. Africa from the Sudan (Wyld 542) to Tanganyika (Burt 2474).

40. *Asplenium uhligii* Hieron. in Engl. Bot. Jahrb. 46 : 374 (1911).

Roux 2009: Accepted name

? *A. aemilii-guineae* of Tard. l.c. 193 (1953).

On rocks in forest; 3,000 to 11,000 ft. alt.

**Br.Cam.:** Bakebe Hill Savory 628 (BM); Cam. Mt. Steele 16 (K), Migeod 189 (K); Cam. Mt., between huts 2 & 3 Keay FHI 28615 (BM), Adams 1289 (BM). **F.Po:** Mann (K).

Also on mountains in E. Africa.

41. *Asplenium buettneri* Hieron. ex Brause in Deutsch. Zentr.-Afr. Exp. 1907–8, 2 : 23, fig. F–G (1910); Tard. l.c. 195, t. 38, fig. 3, 4 (1953).

Roux 2009: Accepted name

On rocks in forest; up to 1,900 ft. alt.

**Ghana:** near Odumasi, Volta River F.R., Adams 365 (BM); Abetifi Scholes 107 (BM); Akwapim Hills Johnson 590 (K); L. Bosumtwi Adams & Akpabla GC 4538 (K), Box 2899 (BM); Aburi Irvine 62 (K), Johnson 993 (K); Mampong Scarp Box 2092 (BM). **Togo:** Gbadsemme–Avatime, Misahöhe Baumann 42 (ex Hieron.). **S.Nig.:** near Ondo Keay FHI 22555 (BM).

Widespread in tropical Africa.

42. *Asplenium blastophorum* Hieron. ex Brause in Engl. Bot. Jahrb. 46 : 378 (1911); Tard. in Mém. I.F.A.N. 28 : 192, t. 36, fig. 5 (1953).

Roux 2009: Accepted name

On trees in gallery forest; up to 5,300 ft. alt.

**Fr.G.:** Djiba, Macenta Adam 5859 (P). **S.L.:** Bintumane T. S. Jones 24 (BM). **Togo:** Bismarckburg Büttner 60 (P). **N.Nig.:** S. of Kabba Elliott 65 (K).

Widespread in E. Africa.

43. *Asplenium adiantum-nigrum* Linn. Sp. Pl. 2 : 1081 (1753); Sim F.S.A. 158, t. 46 (1915); Ogata Ic. Fil. Jap. 8 : t. 352 (1940); Tard. l.c. 195 (1953).

Roux 2009: Accepted name

On rock ledges and lava fields, 10,000 to 13,000 ft. alt.

**Br.Cam.:** Cam. Mt. Adams 1294 (BM), Keay FHI 28621 (BM), Mann 1373 (K), 2040 (K), Brenan 4244 (BM, K).

Also in N. and S. Africa, Tibesti, Mt. Kenya and Europe, N. America and Hawaii.

44. *Asplenium vagans* Bak. in Hook. Syn. Fil. 195 (1867), partly.

Roux 2009: Synonym of *Asplenium sandersonii* Hook.

*Asplenium sandersonii* of Tard. in Mém. I.F.A.N. 28 : 179, t. 33, fig. 4, 5 (1953), not of Hook.

Epiphyte especially on old cacao trees; at low elevations up to 2,500 ft; alt.

**S.Nig.:** Oban Talbot (BM). **Br.Cam.:** Debundscha Box 3620 (BM); Mamfe–Bamenda Road Adams 1687 (BM); 25 miles from Victoria Thorold TN 3 (BM, K); near Nyasaso on road from Tombel Thorold TN 14 (BM, K). **F.Po:** Mt. Balea Guinea 487 (BM).

45. *Asplenium dregeanum* Kunze in Linnaea 10 : 517 (1836); Hook. Syn. Fil. 221 (1867); Sim F.S.A. 166, t. 67 (1915); Tard. l.c. 28 : 197 (1953).

Roux 2009: Accepted name

*Asplenium brachypterum* Kunze in Linnaea 23 : 232 (1850), name only; Houlst. & Moore in Gard. Mag. Bot. 3 : 260 (1851), as “brachypterum”; Hook. Exot. Ferns t. 44 (1858), as “brachypterum.”

On trees and rocks in shade; up to 7,600 ft. alt.

**Fr.G.:** Fassakoidou to Kesseridou Chev. 20820 (K); Ditinn & Diaguissa Chev. 12846 (K). **S.L.:** Don (BM), Barter (K); Kasokora Deighton 1237 (BM, K, NJ); Konno Dist. Dawe 526 (NJ); Bintumane T. S. Jones 9 (BM, NJ), 13 (BM, NJ), Glanville 452 (K, NJ), Jaeger 1161 (K); Sugar Loaf Mt. T. S. Jones 342 (BM, NJ), Sc. Elliot 5756 (K); Koflu Sc. Elliot 4615 (K). **Lib.:** Mao R., Nyandamolahun Bequaert 75 (K); Bobei Mt. Baldwin 9588 (BM). **Iv.C.:** Mt. Tonkoui Abbayes 534 (BM). **Ghana:** Atewa Range Morton (BM); Mpraeso Hills Johnston 671 (K); Adamsu, Ashanti Vigne FH 3517 (K). **Togo:** Amedzofe Box 3433 (BM, K), Scholes 62 (BM). **S.Nig.:** Orosun Peak, Idanre Richards 3776 (BM); Ikwette, Obudu Div. Savory & Keay FHI 25242 (BM); Boshi, Ogoja Dist. Rosevear 70/39 (K). **Br.Cam.:** above Lyonga, Mann’s Spring Richards 4380 (BM, K); Cam. Mt. Adams 1234 (BM), Johnston 136 (K), Mann 2057 (K), 1399 (K); Mimbria Richards 4123 (BM, K); Bamenda Rosevear (BM); Mopanya Kalbreyer 37 (BM); Nkambe to Binka Savory UCI 375 (BM). **F.Po:** Mann (BM, K), 376 (K); Moka Adams 1030 (BM, K).

Widespread in tropical and S. Africa.

[The W. Africa plant is *A. brachypterum* Kunze which Hieronymus (Deutsch. Zentr.–Afr. Exp. 1907–8, 2 : 8 (1910) described as having “scales which are ovate, up to 2 mm. long, over 1 mm. broad at base. Margin with glandular laciniae, pale yellow transparent and little thickened. The inner part of the scale is brown to blackish brown and the cell–walls are very thick and strongly coloured. The scales of the typical *A. dregeanum* Kunze are elongate–ovate or lanceolate, long–acuminate, twice the size of those of *A. brachypterum* and of a uniform rusty brown colour, with no lighter margin.”]

46. *Asplenium preussii* Hieron. ex Brause in Deutsch. Zentr.–Afr. Exp. 1907–8, 2 : 9, t.

1, fig. D (1910); Tard. l.c. 199, t. 39, fig. 3, 4 (1953).

Roux 2009: Accepted name

Terrestrial, especially on rocks, 3,500 to 6,000 ft. alt.

**Fr.G.:** Alaminata Adam 5421 (P), 5443 (P), 5447 (P); La Loffa Adam 4993 (P); Grand Niale Adam 6122 (P); Mt. Balassou Adam 5967 (P); Konosso Adam 5678 (P). **S.L.:** Bintumane Glanville 467 (BM, K, N J). **S.Nig.:** R. Ata, below Mt. Koloishe, Obudu Savory & Keay FHI 25047 (BM); Ikwette–Baleghete path, Obudu Savory & Keay FHI 25200 (BM). **Br.Cam.:** Cam. Mt. Adams 1210 (BM), Savory 560 (BM), Dunlap 61 (K), Johnston 136 (K); above Buea Box 3606 (BM), Migeod 138 (BM, K); below Liwonge, Mann’s Spring Richards 4311 (BM, K); Nkambe, Bamenda Savory UCI 357 (BM), 373 (BM). **F.Po:** Mann (BM), 665 (K).

47. *Asplenium mannii* Hook. Sec. Cent. t. 60 (1861); Hook. Syn. Fil. 221 (1867); Sim F.S.A. 174, t. 61 (1915).

Roux 2009: Accepted name

*Loxoscaphe mannii* (Hook.) Kuhn in Deck. Reise 3, 3 : 37 (1879); Tard. l.c. 28 : 200, t. 39, fig. 8, 9 (1953), excl. syn *Microlepia mannii* Gat.

Epiphyte on the branches of trees in forest; 3,000 to 7,500 ft. alt.

**Fr.G.:** Tibé Peak Adam 500 (ex Tard.). **S.L.:** Bintumane Peak Jaeger 1170 (K). **Br.Cam.:** above L. Oku, Bamenda Keay & Lightbody FHI 28503 partly (BM); Cam. Mt. Adams 1239 (BM); Buea Adams 3162 (K); below Liwonge, Mann’s Spring Richards 4284 (BM, K). **F.Po:** Mann (BM,K), 372 (K), 2058 (K), Newton Hewan (K); Moka Adams 1128 (BM).

Widespread in tropical Africa.

48. *Asplenium cornutum* Alston in Bol. Soc. Brot., sér. 2A, 30 : 8 (1956).

Roux 2009: Accepted name

*Davallia concinna* Hook. Syn. Fil. 100 (1867), partly, not of Schrad.

Epiphyte at 3,000 to 7,500 ft. alt., in montane forest or bamboo thickets.

**Br.Cam.:** Bamenda Rosevear (BM); above L. Oku, Bamenda Keay & Lightbody FHI 28503 partly (BM); Mopanya Kalbreyer 185 (BM); Mann’s Spring Richards 4284 (K), 4379 (BM, K); Wum L., Bamenda Savory UCI 326 (BM). **F.Po.:** Mann 371 (K); Moka Adams 1097 (BM), 3012 (K).

49. *Asplenium hypomelas* Kuhn Fil. Afr. 104 (1868).

Roux 2009: Accepted name

*Davallia nigrescens* Hook. Sec. Cent. t. 93 (1861); Syn. Fil. 101 (1867), not *A. nigrescens* Bl. (1828).

*Loxoscaphe nigrescens* (Hook.) Moore Ind. Fil. 297 (1861); Tard. l.c. 200 (1953).

Epiphyte in mossy forest zone; 4,200 to 6,000 ft. alt.

**Fr.G.:** Béréguiza Adam 6072, 7542, 9004; Nimba Mts. Schnell 327, 413 (all ex Tard.); Fassakoidou, Koniankés Chev. 20796 (K). **S.L.:** Bintumane Jaeger 1206 (K). **Br.Cam.:** above Buea Box 3604 (BM), Migeod 35 (BM, K); Mimbia, near Buea Richards 4124 (BM, K); Mopanya Kalbreyer 189 (BM, K); Cam. Mt. Dunlap 62 (K), Mann 1389 (K); Esell Camp, Cam. Mt. Maitland 1048 (K). **F.Po:** Mann (BM, K), 448 (K); Moka Adams 1041 (BM, K).  
Also in E. Africa from Abyssinia to Rhodesia.

## 23. THELYPTERIDACEAE

Rhizomes terrestrial, creeping or erect; roots without a sheath of sclerenchyma; rhizome–scales not peltate, often bearing unicellular hairs on the margin and surface. Stipes with 2 vascular strands at base, which unite to form a single U-shaped strand. Fronds oblong in outline, pinnate or bipinnate (some *Thelypteris*); surfaces often bearing unicellular (multicellular in *T. palustris*) hairs; costae of pinnae raised on upper surface at base, often grooved, but not decurrent on ridges on the sides of the rhachis; venation of lobes pinnate, veins free or uniting with those arising from the next costa to form an excurrent vein which passes to the sinus; sinuses often with a translucent membrane at base. Sori round or moon-shaped, usually with a reniform indusium. Sporangia glabrous or setose with rather short stalks and an annulus of about 14 cells. Spores monolete with perispore.

- 1        Veins free, or the lowest vein of adjacent groups just meeting at the sinus 1.  
*Thelypteris*  
    Veins from adjacent costae uniting: ----- 2
  - 2        Paraphyses wanting; fronds sometimes with gemma near the apex but not  
irregularly proliferous: 3  
    Paraphyses present; fronds irregularly proliferous; sporangia exindusiate, elongate along veins 5. *Ampelopteris*
  - 3        Sori round, with or without indusia 2. *Cyclosorus*  
    Sori elongate, without indusia: ----- 4
  - 4        Rhizome wide-creeping; fronds villous 3. *Leptogramma*  
    Rhizome erect; fronds glabrous ----- 4. *Menisorus*
- 

### 1. *THELYPTERIS* Schmidel — *Lastrea* Bory; Copel. Gen. 135 (1947).

- 1        Fronds pinnate, with deeply pinnatifid pinnae; tertiary veins simple: 2  
    Fronds bipinnate; tertiary veins forked ----- 7. *cruciata*
- 2        Indusia wanting; short hairs present on lamina and on veins; rhizome suberect;  
lower pinnae reduced 1. *bergiana*  
    Indusia present: ----- 3
- 3        Indusia and lamina covered with yellow glands; rhizome short-creeping; two  
lowest pairs of pinnae usually reduced but not auriculiform 2. *microbasis*  
    Indusia not glandular: ----- 4
- 4        Indusia hairy: 5  
    Indusia glabrous; pinnae gradually reduced with several pairs reduced to auricles ----- 6. *zambesiaca*
- 5        Segments entire: 6  
    Segments strongly toothed; stipes tufted; pinnae gradually reduced but none auriculiform ----- 5. *odontosora*
- 6        Rhizome stout, suberect; lowest pair of pinnae not or slightly reduced; lower  
surface glandular 3. *pseudogueintziana*

Rhizome short–creeping; two basal pairs of pinnae usually reduced to auricles; lower surface not glandular 4.  
*guineensis*

1. *Thelypteris bergiana* (Schlecht.) Ching in Bull. Fan. Mem. Inst. 10 : 251 (1941).

Roux 2009: Synonym of *Amauropelta bergiana* (Schltdl.) Holttum var. *bergiana*

*Polypodium bergianum* Schlecht. Adumbr. Fil. Prom. B. Spei 20, t. 9 (1825).

*Dryopteris bergiana* (Schlecht.) O. Kuntze Rev. Gen. 2 : 812 (1891).

*Aspidium maranguense* Hieron. in Engl. Pflanzenw. Ost–Afr. C: 85 (1895).

*Dryopteris maran–guensis* (Hieron.) C.Chr. Ind. Fil. 276 (1905).

On shaded banks; 2,000 to 6,000 ft. alt.

**S.Nig.:** Mt. Koloishe, Obudu Div. Savory & Keay FHI 25121 (BM). **Br.Cam.:** Cam. Mt. Johnston 131 (K); Liwonge Richards 4246 (K), 4254 (BM, K), 4308 (BM, K). **F.Po.:** Clarence Peak Mann 342 (K); St. Isabel Peak Guinea 2970 (BM); Moka Adams 1042 (BM), 1095 (BM).

Also in E. and S. Africa.

2. *Thelypteris microbasis* (Bak.) Tard, in Mém. I.F.A.N. 28 : 117, t. 20, fig. 1 (1953).

Roux 2009: Synonym of *Christella microbasis* (Baker) Holttum

*Nephrodium microbasis* Bak. Syn. Fil. 496 (1874).

*Dryopteris microbasis* (Bak.) O. Kuntze Rev. Gen. 2 : 818 (1891).

Up to about 4,000 ft. alt.

**Fr.Sud.:** Moussaia Chev. 398 partly (P). **Fr.G.:** Ditinn Gorges, Dalaba Caille (P); Pita, Fouta Djallon Pobéguin 9 (BM), 2228 (P). **Lib.:** Firestone Plantation Harley 89 (BM). **Iv.C.v.:** Fort Hettos, Danané Chev. 21204 (P). **Ghana:** Techiman Adams & Akpabla GC 4494 (BM). **Dah.:** Kouandé to Konkobiri Chev. 24257 (BM, P). **N.Nig.:** Vom, Jos Plateau Morton K. 387 (GC). **S.Nig.:** Onitsha Barter 571 (K). **Br.Cam.:** Bamenda–Bambui Road Morton K. 66 (BM, GC).

3. *Thelypteris pseudogueintziana* (Bonap.) Alston comb. nov.

Roux 2009: Synonym of *Christella pseudogueinziana* (Bonap.) J.P.Roux

*Dryopteris pseudogueintziana* Bonap. in Bull. Jard. Bot. Brux. 4 : 4 (1913).

*D. membranifera* C.Chr. in Bonap. Notes Ptérid. 16 : 170, t. 2, fig. C (1925).

*Cyclosorus membraniferus* (C.Chr.) Alston in Contrib. Conh. Fl. Moçamb. 12 : 37 (1954).

? *Aspidium natalense* Fée 8 Mém. Foug. 8 : 102 (1857).

In *Raphia* palm swamp, at 3,600 ft. alt.

**Br.Cam.:** Ndop, Bamenda, Adams 1536 (BM).

Also E. and S. Africa and Madagascar.

4. *Thelypteris guineensis* (Christ) Alston in Bull. Brit. Mus. (Nat. Hist.) Bot. 1 : 48 (1952).

Roux 2009: Synonym of *Christella guineensis* (H.Christ) Holttum

*Dryopteris guineensis* Christ in Journ. de Bot. 22 : 22 (1909).

*Thelypteris microbasis* of Tard. in Mém. I.F.A.N. 28 : 117 (1953), partly.

**Fr.G.:** Labé Chev. 12363 (P), 12385 (P); Mt. Nimba Adam 4848 (P); Milo, Macenta Adam 5914 (P); Fouta Djallon Pobéguin (P); Timbikounda Chev. 20603 bis (P); Banfora Ravisse 6 (P).  
South to Angola (Carrisso & Mendonca 569) and K. Rhodesia.

5. *Thelypteris odontosora* (Bonap.) Ching in Bull. Fan Mem. Inst. Biol., Peiping, Bot. Sér., 10 : 253 (1941).

Roux 2009: Synonym of *Amauropelta odontosora* (Bonap.) Holttum

*Dryopteris odontosora* Bonap. Notes Ptérid. 4 : 17 (1917).

**Iv.C.:** Abidjan, Dabou, Bingerville Chev. 15605 (BM).

6. *Thelypteris zambesiaca* (Bak.) Tard. in Notulae Syst. 14 : 352 (1952); Mém. I.F.A.N. 28 : 119, t. 20, fig. 5, 6 (1953).

Roux 2009: Synonym of *Pseudocyclosorus pulcher* (Bory ex Willd.) Holttum

*Nephrodium zambesiaceum* Bak. in Ann. Bot. 5 : 318 (1891).

*Dryopteris zambesiaca* (Bak.) C.Chr. Ind. Fil. 301 (1905).

Terrestrial in forest; 3,000 to 5,000 ft. alt.

**S.Nig.:** Mt. Koloishe, Obudu Div. Savory & Keay FHI 25071 (BM). **F.Po.:** L. Loretto, Moka Adams 1028a (BM).

Also in Uganda (Taylor 2827), Belgian Congo (Longfield 100) and Angola (Young 1119).

7. *Thelypteris cruciata* (Willd.) Tard. in Notulae Syst. 15 : 91 (1954).

Roux 2009: Synonym of *Pseudophegopteris cruciata* (Willd.) Holttum

*Aspidium cruciatum* Willd. Sp. Pl. 5 : 278 (1810).

*Dryopteris cruciata* (Willd.) C. Chr. Ind. Fil. 259 (1905).

*Thelypteris glabrata* var. **hirsuta** Tard. in Notulae Syst. 14 : 344 (1952); in Mém. I.F.A.N. 28 : 120, fig. 12, 13 (1953).

**Iv.C.:** Mt. Tonkoui Abbayes 548 (P). **Ghana:** Puso Fuso Ravine Scholes 441 (BM), Adams 322 (BM), 404 (K), 1451 (BM). **S.Nig.:** Wum Road, mile 42, Bamenda Savory UCI 318 (BM). **F.Po.:** Moka Adams 1092 (BM); near L. Loretto Adams 1018 (BM).

Also in Mascarene Islands.



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## 2. *CYCLOSORUS* Link (1833) — Copel. Gen. 140 (1947).

1 Sori continued round base of sinus; texture of pinnae subcoriaceous; plants growing in marshy ground; scales present on costa; lower pinnae not reduced, usually short-stalked; rhizome wide-creeping, black, almost without scales; sporangia not setose: 2

Sori parallel to costae of segments or confined to the apices; texture of pinnae chartaceous or herbaceous; not marsh plants; no scales on costae; ----- 3

2 Pinnae lobed about half way to the costa, segments subacute, usually pubescent; vein arising at an angle of 30 degrees from the costa 1. *gongyloides*

Pinnae lobed more than two-thirds of the way to the costa; segments rounded at apex, usually glabrous; veins arising from the costa at an angle of 50 degrees ----- 2. *striatus*

3 Sori confined to the segments; rhizome wide-creeping leaving a broad sterile space along the costae of the pinnae; yellow glands on costae 3. *interruptus*

Sori extending down the segments almost to the costa: ----- 4

4 One pair of basal tertiary veins normally united in the leaf-tissue and sending an excurrent branch to the sinus: 5

Two or more pairs of basal tertiary veins united in the leaf-tissue: ----- 6

5 Upper surface hairy on lamina, long hairs on veins; indusia with a few long hairs; one basal pair (rarely more) of pinnae somewhat smaller than other pairs or equalling the next pair above; pinnae lobed two-thirds of the way to the costa; rhizome suberect; partially sterile fronds sometimes with a pair of sori at the base of each sinus only

4. *quadrangularis*

Upper surface glabrous between veins; hairs on veins mostly short; indusia with numerous short hairs; basal pinnae normally gradually decrescent; pinnae lobed just over half way to costa; rhizome short-creeping; sori normally developed throughout each fertile lobe ----- 5. *dentatus*

6 Terminal pinnae crenate but not lobed, long-stipitate with gemma at base; lateral pinnae subentire with about 6 pairs of veins united; indusia wanting; sporangia glabrous; rhizome short-creeping 6. *blastophorus*

Terminal pinnae lobed: ----- 7

7 Gemma present at base of terminal pinna; indusium wanting; sori subcostular; sporangia glabrous; rhizome erect; lowest pair of pinnae slightly smaller than the pair above 7. *patens*

Gemma wanting; fronds decrescent at base; sori medial: ----- 8

8 Sporangia ciliate: 9

Sporangia glabrous; spores verrucose; indusium present, rather persistent; pinnae alternate; sori punctate; fronds abruptly decrescent with several pairs of auricle-like pinnae ----- 10. *elatus*

9 Spores alate; indusium wanting, glabrous; rhizome stout, short-creeping; pinnae in lower two-thirds subopposite, overlapping rhachis; sori slightly elongate; costa ciliate

8. *oppositifolius*

Spores verrucose; indusium present, deciduous; rhizome wide-creeping; pinnae alternate; sori punctate; costa glabrous ----- 9. *affer*

*Cyclosorus gongylodes* (Schkuhr) Link Hort. Berol. 2 : 138 (1833); Tard. in Mém I.F.A.N. 28 : 126, t. 22, fig. 2, 3 (1953), as “goggilodus.”

Roux 2009: Synonym of *Cyclosorus interruptus* (Willd.) H.Itô

*Aspidium gongylodes* Schkuhr Krypt. Gew. 1 : 193, t. 33c (1809), by error “goggilodus.”

*Dryopteris gongylodes* (Schkuhr) O. Kuntze Rev. Gen. Pl. 2 : 811 (1891); C.Chr. in Mem. K. Danske Vidensk. Selsk. ser 7, 10 : 93 (1913).

*Polypodium unitum* Linn. Syst. Nat. ed. 10, 2 : 1326 (1759), partly, as to Burm. & Rehver. but excl. syn. Swane.

**Sen.:** Farmar (K), Michilin (K); near Cham, M'Boro, Cape Verde Peninsula Leprieur (P); Niombato, Kaolack Adam 1304 (P); Niayes, Cap Verde Adam 412 (P). **Gam.:** Perrottet (P).

Also in E. Africa, Madagascar, tropical Asia and tropical America.

2. *Cyclosorus striatus* (Schum.) Ching in Bull. Fan. Mem. Inst. Biol. 10 : 249 (1941); Copel. Gen. Fil. 143 (1947).

Roux 2009: Accepted name

*Aspidium striatum* Schum. in K. Danske Vidensk. Selsk. 4 : 230 (1829).

*Dryopteris striata* (Schum.) C.Chr. Ind. Fil. 294 (1905).

*Polypodium pallidivenium* Hook. Spec. Fil. 5 : 8 (1863).

Abundant in marshes, usually in cleared forest country, fully exposed to the sun.

**Sen.:** Cap Verde Adam 865; Sangalkam Hubert; Thies De Wailly 4865 (all ex Tard.). **Gam.:** waterworks near Bathurst Fraser 47 (BM). **Port. G.:** Baptista 152 (LISJC); Pessube, Bissau Esp. Santo 1528 (LISC, LISJC). **Fr.G.:** (ex Tard.). **S.L.:** Newton T.S. Jones 350 (BM.NJ); Konya Thomas 3067 (K); Sherbro Is. Hunter (BM); Mahnoo Mair (K); Regent Sc. Elliot 4119 (BM, K). **Lib.:** Ganta Harley 40 (K), 79 (K); Grand Bassa T. Vogel 61 (K). **Iv.C.:** (ex Tard.). **Ghana:** Asuansi Box 2052 (BM), 2086 (BM); Kumasi Box 2908 (BM); Brawile, Axim Cudjoe 3 (BM), Johnson 18 (K), 994 (K); Techiman Adams & Akpabla GC 4519 (K); Atwabo Fishlock 43 (K). **Togo:** Lome Warnecke 420 (BM). **Dah.:** (ex Tard.). **N.Nig.:** swamp on Zungeru rd., 40 miles from Bida Meikle 1026 (K); Nupe Barter 1444 (K); Kontagora Dalz. 248 (K); Matyoro Thornevill 126 (K). **S.Nig.:** Lagos Dalz. 1420 (K), Lowe (BM); Omo (formerly part of Shasha) F.R. Richards 3405 (BM), Jones FHI 16690 (BM), 17235 (BM); Sapoba F.R., Benin Jones FHI 1082 (BM), 1284 (BM); Iva valley, Enugu Jones FHI 1074 (BM); Mt. Koloishe, Obudu Div. Savory & Keay FHI 25131 (BM). **Br.Cam.:** Buea to Victoria Fraser 41 (BM). **F.Po:** T. Vogel (K), Barter (K); Moka Guinea 2233 (BM).

Widespread in tropical Africa from R. Sudan (Andrews 1448), south to Angola (Young 616).

3. *Cyclosorus interruptus* (Willd.) H. Ito in Bot. Mag. Tokyo 51 : 714 (1937); Ching in Bull. Fan. Mem. Inst. Biol. 8 : 184 (1938); Tard. l.c. 127 (1953).

Roux 2009: Accepted name

*Pteris interrupta* Willd. Phytogr. 1 : 13, t.10, fig. 1 (1794).

*Dryopteris interrupta* (Willd.) Ching in Lingn. Sci. Journ. 12 : 566 (1933).

*Aspidium pteroides* Sw. in Schrad. Journ. für Bot. 1800, 2 : 33 (1801).

*Dryopteris pteroides* (Sw.) O. Kuntze Rev. Gen. 2 : 813 (1891).

**F.Po:** T. Vogel (K).

Also in Ubangi-Shari and French Cameroons (Zenker 1463) and tropical Asia.

4. *Cyclosorus quadrangularis* (Fee) Tard. in Notulae Syst. 14 : 345 (1952); in Mém. I.F.A.N. 28 : 123, t. 21, fig. 10–12 (1953).

Roux 2009: Synonym of *Christella hispidula* (Decne.) Holttum

*Nephrodium quadrangulare* Fée Mém. 5me. Foug. 308 (1852).

*Dryopteris quadrangularis* (Fée) Alston in J. Bot. 75 : 253 (1937).

*Polypodium molle* Jacq. Coll. Bot. 3 : 188 (1789).

In shade usually, in secondary growth or cultivated areas; at low elevations.

**S.L.:** Njala Deighton 5869 (BM, NJ). **Lib.:** near Gbeidin Harley 166 (BM), 167 (BM); Bilimu Harley 190 (BM). **Iv.C.:** Touba Circle Papion du Chateau (ex Tard.). **Ghana:** Asuansi Box 2041 (BM), 2057 (BM); Potroasi Adams 393 (BM, K); Bompata Vigne FH 2703 (K); Kumasi Cummins 88 (K); Mampong Vigne FH 4102 (K). **S.Nig.:** Omo (formerly part of Shasha) F.R. Richards 3406 (BM), 3392 (BM), Ross 209 (BM); Okomu F.R. Richards 3861 (BM, K). **F.Po:** T. Vogel 69 (K); L. Loretto Adams 1028 (K).

Also in tropical America.

5. *Cyclosorus dentatus* (Forsk.) Ching in Bull. Fan Mem. Inst. Biol. 8 : 206; Tard. l.c. 28 : 121, t. 21, fig. 7–9 (1953).

Roux 2009: Synonym of *Christella dentata* (Forssk.) Brownsey & Jermy

*Polypodium dentatum* Forsk. Fl. Aegypt–Arab. 185 (1775).

*Dryopteris dentata* (Forsk.) C.Ch. in K. Danske Vidensk. Selsk. Skr. ser. 8, 6 : 24 (1920).

Roadside banks and palm groves on damp ground, often by streams in secondary growth; up to 3,800 ft. alt.

**Fr.G.:** Heudelot 885 (K); Macenta Adam 4778 (P). **S.L.:** Don (BM), T. Vogel (K); Njala Deighton 1574 (BM, K); near Freetown Welwitsch 4 (BM), 46 (BM); Wallia Sc. Elliot 4571 (K); Foulah Bay Barter (K, var. cristata); Kamke Thomas 2045 (K). **Lib.:** Gbeidin Harley 170 (BM, K); Firestone Plantation 3, Du R. Linder 225 (K). **Iv.C.:** Adiopodoumé Abbayes 331 (BM). **Ghana:** Boti, Huhunya Adams 281 (BM); Ampesen F.R., Prestea Cudjoe 35 (BM), 44 (BM); Sahun Adams 382 (BM); Axim Cudjoe 7 (BM). **Togo:** Kersting 655a (BM). **Dah.:** Pobé to Adjonjéré Chev. 22940 (ex Tard.); Zagnanado Circle Chev. 23066 (ex Tard.). **N.Nig.:** Kontagora Dalz. 247 (K); Nupe Barter (K). **S.Nig.:** Ibadan Meikle 1477 (K); Iju, Lagos Lowe (BM); Okeigbo, Ondo Jones & Onochie FHI 14712 (BM); Onda, Omo F.R. Jones & Onochie FHI 17574 (BM); Balinge–Ikwwete path, Obudu Div. Savory & Keay FHI 25159 (BM). **Br.Cam.:** Buea Fraser 30 (BM).

Also in tropical Africa and Asia.

6. *Cyclosorus blastophorus* Alston in Bol. Soc. Brot. sér. 2A, 30 : 12 (1956).

Roux 2009: Synonym of *Pneumatopteris blastophora* (Alston) Holttum

On ground in ravine and high forest; at 1,000 to 4,000 ft. alt.

**S.Nig.:** R. Ata, below Mt. Koloishe, Obudu Div. Savory & Keay FHI 25062 (BM). **F.Po:** Mann 377 (K).

7. *Cyclosorus patens* (Fée) Copel. Gen. Fil. 143 (1947).

Roux 2009: Synonym of *Pneumatopteris blastophora* (Alston) Holttum

*Goniopteris patens* Fée Gen. Fil. 253 (1852).

*Gymnogramme unita* Kunze in Linnaea 18 : 115 (1844).

*Polypodium unitum* (Kunze) Hook. Spec. Fil. 5 : 5 (1863), not of Linn. (1759).

*Goniopteris silvatica* Pappe & Raws. Syn. Fil. Afr. Austr. 39 (1858).

*Dryopteris silvatica* (Pappe & Raws.) C.Chr. Ind. Fil. 292 (1905).

On ground in shade, in forest; 1,500 to 7,000 ft. alt.

**Lib.:** Bilimu Harley 188 (BM). **Ghana:** Puso Puso Ravine Adams 403 (BM). **Br.Cam.:** Nkambe, Bamenda Savory UCI 370 (BM); Cam. Mt. Mann 2048 (BM, K).

Also south to Natal.

8. *Cyclosorus oppositifolius* (Hook.) Tard. in Mém. I.F.A.N. 28 : 128 (1953), excl. syn.

Roux 2009: Synonym of *Pneumatopteris oppositifolia* (Hook.) Holttum

*Dryopteris afra* Christ and *D. dewevrei* Christ, and excl. fig. and descr.

*Polypodium oppositifolius* Hook. Spec. Fil. 5 : 8 (1863).

**F.Po:** Novitla, near Clarence Peak T. Vogel 62 (K).

Also in S. Tomé

9. *Cyclosorus afer* (Christ) Ching in Bull. Fan. Mem. Inst. Biol. 10 : 242 (1941).

Roux 2009: Synonym of *Pneumatopteris afra* (H.Christ) Holttum

*Dryopteris afra* Christ In Mém Soc. Bot. Fr. 8 : 107 (1908), partly (excl. Moller spec), as “afrus.”

*D. dewevrei* Christ ex Bonap. Notes Ptérid. 14 : 207 (1924).

? *Aspidium aquapimense* Schum. in K. Danske Vldensk. Selsk. 4 : 230 (1829).

*Nephrodium abruptum* of Hook. Spec. Fil. 4 : 77 (1862), not of Presl.

*N. pennigerum* of Bak. Sym. Fil. 292 (1874), partly, as to Guin. plant.

*Cyclosorus oppositifolius* of Tard. in Mém. I.F.A.N. 28 : 128, t. 21, fig. 4, 6 (1953), partly.

*Cyclosorus dewevrei* (Christ ex Bonap.) Adams & Alston in Bull. B.M.(Nat. Hist.) Bot. 1 : 157 (1955).

Marshy places in forest; up to 3,500 ft. alt.

**Fr.G.:** Sikouran Nickles (P). **S.L.:** Zimi, Gola Forest Deighton 4098 (NJ); Bintumane T. S. Jones 17 (BM, N J); Nicol Brook, Freetown Johnston (BM), 24 (K); Makali, Mabouto Dist. T. S. Jones 32 (BM). **Lib.:** Gbeidin Harley 169 (BM, K); Bilimu Harley 183 (K); Firestone Plantation Harley 88 (K). **iv.C.:** Adiopodoumé Abbayes 147 (BM); Touba, Papion du Chateau (K). **Ghana:** Asuansi Box 2078 (BM), 2043 (BM), 2059 (BM); Benyimade, Axim Cudjoe 8 (K); Kumasi Cummins 215 (K), 188 (K); Akropong, Akwapim Irvine 2620 (K); L. Bosumtwi Adams 539 (BM). **S.Nig.:** Okomu F.R. Richards 3643 (BM!, K); New Calabar B. Fraser 23, 24 (BM); Old Calabar Holland 82 (K). **Br.Cam.:** Victoria Kalbreyer 21 (BM, K); Buea Fraser 38 (BM), 29 (BM), 32 (BM); Kumba Ejiofor FHI 14030 (BM); Bamenda Rosevear (BM). **F.Po.:** Mann (BM), 140 (K), Gregory (BM), T. Vogel (K), Barter (K); Clarence Peak T. Vogel 120 (K).

South to Angola.

10. *Cyclosorus elatus* (Mett.) Alston in Bol. Soc. Brot. sér. 2A, 30 : 13 (1956).

Roux 2009: Synonym of *Pneumatopteris venulosa* (Kuntze) Holttum

*Aspidium elatum* Mett. ex Kuhn Fil. Afr. 130 (1868).

*Dryopteris elata* (Mett.) C.Chr. Ind. Fil. 263 (1905).

*Nephrodium venulosum* Hook. Spec. Fil. 4 : 71 (1862), not of Desv. (1827).

*Cyclosorus venulosus* (Hook.) Tard. in Notulae Syst. 14 : 345 (1952).

**F.Po** Mann (K).

Also in **S. Tomé**.

[Mme. Tardieu's specimens from French Guinea and Ivory Coast are more deeply cut and may be different.]

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3. *LEPTOGRAMMA* J. Sm. — Ching in Sinensia 7 : 97 (1936).

Roux 2009: Synonym of *Stegnogramma* Blume

Terrestrial ferns with slender creeping rhizomes and brown ciliate scales; stipes pale, pubescent; fronds pinnate with pinnatifid apices; pinnae pinnatifid, opposite or alternate, sessile; venation pinnate; sori elongate along the ultimate veins, exindusiate; sporangia with 2 apical cilia; spores spinulose.

*Leptogramma pilosiuscula* (Wikstr.) Alston in Bol. Soc. Brot. sér. 2A, 30 : 17 (1956).

Roux 2009: Synonym of *Stegnogramma pozoi* (Lag.) K.Iwats.

*Acrostichum pilosiusculum* Wikstr. in Kongl. Vet. Acad. Handl. 1825: 439 (1826).

*Polypodium tottum* Willd. Sp. Pl. 5 : 201 (1810), not of Thunb. (1800).

*P. africanum* Desv. in Mem. Soc. Linn. Par. 6 : 239 (1827).

*Dryopteris africana* (Desv.) C.Chr. Ind. Fil. 250 (1905), partly, excl. Asiatic plant ?;

Sim F.S.A. 102, t. 23 (1915).

*Leptogramma africana* (Desv.) Ching in Sinensia 7 : 101, t. 8 (1936).

*Polypodium eliasii* Sennen & Pau in Bull. Acad. Int. Géogr. Bot. 94 (1910).

In forest fringe, 1,500 to 7,000 ft. alt.

**Br.Cam.:** Cam. Mt. Mann 1375 (K); Liwonge Richards 4246a (BM, K). **F.Po:** Mann (BM, K), 358 (K).  
Also in Atlantic Islands and eastern Africa from the Sudan (Macleay 415) to Cape Province.

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4. *MENISORUS* Alston in Bol. Soc. Brot. sér. 2A, 30 : 20 (1956).

Terrestrial fern with short erect rhizome; scales few, ovate, brown; fronds clustered, glabrous, uniform, pinnate, apical pinnae simple, gemmiferous at base; pinnae about 10 on either side, alternate or subopposite, narrowly lanceolate, regularly and distantly serrate; secondary veins parallel, terminating on teeth; tertiary veins anastomosing to form a single row of areoles on either side; sori at the apices of the areoles, lunate, exindusiate; sporangia glabrous.

*Menisorus pauciflorus* (Hook.) Alston l.c. (1956).

Roux 2009: Accepted name

*Meniscium pauciflorum* Hook. Spec. Fil. 5 : 164 (1864).

*Dryopteris pauciflora* (Hook.) C.Chr. Ind. Fil. 283 (1905).

*Polypodium prionodes* Wright in Kew Bull. 1906: 253.

On rocks by streams in forest at 3,800 ft. alt.

**S.Nig.:** Ikvette–Baleghete path, Obudu Div. Savory & Keay FHI 25192 (BM).  
South to Angola and in eastern Africa from the Sudan (Macleay 436) south to Tanganyika (Schlieben 3932).

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5. *AMPELOPTERIS* Kunze — Copel. Gen. 143 (1947).

Large scrambling, terrestrial fern, rhizome creeping; stipes approximate; fronds of indefinite growth, pinnate, irregularly proliferous and producing smaller fronds in the axils of the pinnae; veins anastomosing in pairs: usually sterile but sori elongate along veins, exindusiate; paraphyses present.

*Ampelopteris prolifera* (Retz.) Copel. Gen. Fil. 144 (1947).

Roux 2009: Accepted name

*Hermionitis prolifera* Retz. Obs. Bot. 6 : 36 (1791).

*Goniopteris prolifera* (Retz.) Presl Tent. Pterid. 183 (1836); Ching in Bull. Fan Mem. Inst. Biol. 8 : 260 (1938).

*Dryopteris prolifera* (Retz.) C.Chr. Ind. Fil. 286 (1905).

*Cyclosorus proliferus* (Retz.) Tard. in Notulae Syst. 14 : 346 (1952); in Mém. I.F.A.N. 28 : 128 (1953).

In wet open places.

**Sen.:** Cayor, Niayes, Cap Verde Adam 2392 (P). **Fr.G.:** Boundoubori, Tougué Nickles 21 (P); near Timbo Chev. 13598 (P).

Through the Old World tropics to New Guinea.

## 24. ATHYRIACEAE

Rhizomes terrestrial, usually short, stout and suberect; scales not clathrate, with entire or toothed margins. Stipes sometimes wide and flattened at base and then contracted before joining the caudex, sometimes with papillae in spines near the base, these being the base of fallen scales; vascular strands 2 uniting upwards into a single U-shaped strand; costae grooved above with the edges of the groove often thin and raised, interrupted and enlarged at the junction of a pinnule with the pinnae–rhachis, the edge of the lamina not decurrent on the edge of the rhachis; septate hairs present on the upper surface in some species; venation free or anastomosing. Sori rounded or elongate, with or without indusia. Sporangia with rather long stalks, annulus 14–16 celled. Spores monolete with perispore.

- 1 Sori J-shaped, or rounded, with or without indusia; veins all free: 2  
Sori indusiate elongate along the veins, usually 2 back to back on each vein; veins free or anastomosing --3.  
*Diplazium*
- 2 Indusia ovate, long–acuminate at base of sori; sori round 1. *Cystopteris*  
Indusia elongate, sometimes curved, lateral; sori elongate or if round exindusiate -----2. *Athyrium*

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### 1. *CYSTOPTERIS* Bernh.— Sim F.S.A. 88 (1915); Copel. Gen. 146 (1947).

Terrestrial fern; rhizome short–creeping, with pale brown scales; stipes clustered near the apex; fronds lanceolate, acuminate, bipinnate, glabrous, 7–10 cm. long, 1.75–3 cm. broad; spores monolete, spinulose.

*Cystopteris fragilis* (Linn.) Bernh. in Schrad. Neues Journ. Bot. 1, 2 : 26, t. 2, fig. 9 (1806); Sim F.S.A. 88, t. 8 (1915).

Roux 2009: Accepted name

*Polypodium fragile* Linn. Sp. Pl. 2 : 1091 (1753), (by error *F. fragile*).

**Br.Cam.:** Cam. Mt. Boughey (GC). **F.Po:** Mann (K).

Temperate regions and tropical mountains generally.

Diploid, tetraploid, hexaploid and octoploid plants are known and may require taxonomic recognition.

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### 2. *ATHYRIUM* Roth— Sim F.S.A. 131 (1915); Copel. Gen. 147 (1947), partly.

- 1 Rhizome creeping; spores with anastomosing ridges; plants medium sized, usually about 45 cm. high, with lanceolate fronds 1. *schimperii*  
Rhizome erect; stipes tufted; large plants, 75 cm. high or more: -----2
- 2 Spores smooth; pinnules ovate; sori with indusia, elongate 2. *Ammifolium*  
Spores alate–rugose with short ridges; pinnules oblong; sori exindusiate, round -----3. *glabratum*



1. *Athyrium schimperi* Moug. ex Fée Gen. Fil. 187 (1852); Sim F.S.A. 133, t. 41 (1915); Tard. in Mém. I.F.A.N. 28 : 161, t. 30, fig. 3, 4 (not 5, 6) (1953).

Roux 2009: Accepted name

*Asplenium schimperi* (Moug. ex Fée) A. Br. in Schweinf. Beitr. Fl. Aeth. 1 : 224 (1867); Bak. Syn. Fil. 489 (1874).

Terrestrial in montane grassland among rocks in open; 6,000 to 10,000 ft. alt.

**Br.Cam.:** Cam. Mt. Adams 1219 (BM), 1257 (BM), Savory 564 (BM), Johnston (BM), Migeod 161 (BM, K), Mildbr. 10844 (K), Mann 1371 (K); Bambulue, Bamenda Savory 476 (BM).

Also French Cameroons (Bambuto Mts.), E. African mountains and the Himalayas.

2. *Athyrium Ammifolium* (Mett.) C.Ch. Ind. Fil. 139 (1905); Tard. l.c. 161, t. 30, fig. 5, 6 (not 3, 4) (1953).

Roux 2009: Accepted name

*Asplenium Ammifolium* Mett. ex Kuhn Fil. Afr. 96 (1868).

Terrestrial In forests; 3,000 to 7,000 ft. alt.

**S.Nig.:** Ikwette, Obudu Div. Savory & Keay FHI 25186 (BM). **Br.Cam.:** Cam. Mt. Dusen (ex Tard.), Migeod 247 (BM, K); Bamenda–Bambui Road Morton 171 (BM, GC). **F.Po:** Mann (BM), 347 (K), 353 (K), 2047 (K); St. Isabel Peak Guinea 2989 (BM), 2892 (K), Adams 1177 (BM); near Ilache Fall Adams 1071 (BM).

3. *Athyrium glabratum* (Mett.) Alston in Bol., Soc. Brot. sér. 2A, 30 : 11 (1956).

Roux 2009: Synonym of *Deparia boryana* (Willd.) M.Kato

*Aspidium glabratum* Mett. in Kuhn Fil. Afr. 133 (1868).

*Nephrodium glabratum* (Mett.) Bak. Syn. Fil. 300 (1874).

*Dryopteris glabrata* (Mett.) O. Kuntze Rev. Gen. Pl. 2 : 812 (1891).

*Thelypteris glabrata* (Mett.) Tard. in Notulae Syst. 14 : 344 (1952); in Mém. I.F.A.N. 28 : 120 (1953), partly, excl. var. *hirsuta*.

*Nephrodium catopterum* var. **glabra** Hook. Spec. Fil. 4 : 137 (1862), partly.

Terrestrial in forest; 3,500 to 6,000 ft. alt.

**S.Nig.:** R. Ata, below Mt. Koloishe, Obudu Div. Savory & Keay FHI 25032 (BM). **Br.Cam.:** path to Mann's Spring, Cam. Mt. Adams 1634 (BM). **F.Po:** Mann (BM); St. Isabel Peak, Adams 1178 (BM); near Moka Adams 1045 (BM); Balaiha Guinea 1533 (BM).

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3. *DIPLAZIUM* Sw. in Schrad. Journ. für Bot. 1800, 2 : 61 (1801).

*Athyrium* of Copel. Gen. 148 (1947), partly.

- 1 Veins free or sparingly anastomosing; fronds not proliferous; stipes without spines: 2  
 Veins regularly anastomosing; ultimate pinnules about 5 cm. broad, 17.5 cm. long; fronds proliferous; stipes with short spines near the base ----- 5. *proliferum*
- 2 Fronds pinnate or bipinnatifid: 3  
 Fronds bipinnate: ----- 4
- 3 Terminal pinna similar to lateral pinnae; margin crenate and acutely serrate; veins close and subparallel, all free 1. *sammatii*  
 Terminal pinna deeply pinnatifid; margin lobed or crenate, with lobes entire or crenulate; veins diverging, sparingly anastomosing ----- 2. *welwitschii*
- 4 Fronds bipinnate with pinnules about 4.5 cm. long, lobed about one-quarter way to the costa; sori usually only on lowest anadromous veinlet; scales lanceolate 3. *hylophilum*  
 Fronds tripinnate or tripinnatifid with pinnules about 7.5 cm. long, crenate and lobed almost to the costa; sori about 10 to each lobe; scales linear ----- 4. *zanzibaricum*

1. *Diplazium sammatii* (Kuhn) C.Chr. Ind. Fil. 238 (1905).

Roux 2009: Accepted name

*Asplenium sammatii* Kuhn in v. Deck. Reisen 3, pt. 3, Bot. 34 (1879).

*Athyrium sammatii* (Kuhn) Tard. in Notulae Syst. 14 : 334 (1953); Mém. I.F.A.N. 28 : 165, t. 11, fig. 3, 4 (1953).

*Asplenium ottonis* of Kuhn Fil. Afr. 109 (1868), not of Hook.

*A. crenato-serratum* Bommner ex Christ in Bull. Herb. Boiss. 4 : 662 (1896); In De Wild. & Dur. III. Fl. Congo 1 : 53, t. 27 (1899).

*Diplazium gillettii* Christ in Ann. Mus. Congo, sér. 5, 3 : 31 (1909).

*Diplazium bommeri* C.Chr. Ind. HI. 228 (1905).

*Diplazium zenkeri* Hieron. in Engl. Bot. Jahrb. 46 : 347 (1911).

Terrestrial in forest shade, on banks of stream and marshes at low elevations.

**Fr.G.:** Macenta Adam 4791 (P); Nzérékoré Adam 3267 (P). **S.L.:** Nyanyahun, Pujehun–Gandohun Deighton 1614 (NJ); Gegbwena Deighton 3863 (BM, NJ). **Lib.:** Ganta Harley 124 (BM). **Iv.C.:** Banané Chev. 21282 (P). **Ghana:** R. Kakumat, Asuansi Box 2881 (BM), 2055 (BM), Adams 118 (BM); Neung F.R., Tarkwa Cudjoe 27 (K). **Dah.:** Sakété Chev. 22877 (P). **S.Nig.:** Omo (formerly part of Shasha) F.R., Richards 3237 (BM), 3243 (BM), Ross 29 (BM), Jones & Onochie FHI 17169 (BM, K.); Kwa Falls, Calabar Richards 3989 (BM, K).

Also in the Sudan and Belgian Congo.

2. *Diplazium welwitschii* (Hook.) Diels in E. & P. Pflanzenfam. 1, 4 : 226 (1899).

Roux 2009: Accepted name

*Asplenium welwitschii* Hook. Syn. Fil. 235(1867).

*Athyrium welwitschii* (Hook.) Tard. in Notulae Syst. 14 : 334 (1952); in Mém. I.F.A.N. 28 : 166, t. 31, fig. 5, 6 (1953), incl. var. *mildbraedii* (Brause) Tard. l.c.

*Diplazium mildbraedii* Brause in Engl. Bot. Jahrb. 53 : 380 (1915).

*Diplazium silvaticum* var. **rousseaui** Bonap. Notes Ptérid, 1 : 79 (1915), name only. *D. silvaticum* var. *pinnatifida* Bonap. op. cit. 10 : 109 (1920).

*Diplazium variinerve* Hieron. ex Mildbr. Wiss. Ergebn. 1910–11, 2 : 51 (1922), name only.

*Athyrium letouzeyi* Tard. in Notulae Syst. 14 : 334 (1952); Mém. I.F.A.N. 28 : 165, t. 3, fig. 1, 2 (1953).

On ground in shade.

**Iv.C.:** Assinie Chaper (P); région des Lagunes Cervoni (K, P). **Ghana:** Puso Puso Adams 90 (BM), 412 (BM, K); near Potroasi, Kibi Adams 158 (BM). **F.Po:** Mann (BM), 144 (K).

Also south to Angola.

### 3. *Diplazium hylophilum* (Hieron.) C.Chr. Ind. Fil. 233 (1905).

Roux 2009: Synonym of *Diplazium nemorale* (Baker) Schelpe

*Asplenium hylophilum* Hieron. in Engl. Pflanzenw. Ost–Afr. C: 84 (1895).

*Athyrium arborescens* of Tard. in Mém. I.F.A.N. 28 : 167 (1953), partly, excl. syn. Bory.

On ground in hill forest; 1,000 to 1,500 ft. alt.

**Fr.G.:** Bereguizi, Macenta Adam 7573 (P); Bakoré Adam 5138 (P). **Lib.:** Bilimu Harley 1996 (K), 68 (BM). **Iv.C.:** Gouekangouine to Droupleu Chev, 21444 (K, P). **Ghana:** Puso Puso Ravine, Kibi Mts. Box 3263 (BM), Adams 75 (BM), 505 (BM, K). **F.Po:** Mann (K).

Also in Uganda and Tanganyika.

### 4. *Diplazium zanzibaricum* (Bak.) C.Chr. Ind. Fil. 241 (1905).

Roux 2009: Accepted name

*Asplenium zanzibaricum* Bak. in Ann. Bot. 5 : 311 (1891).

*A. sulcinervium* Hieron. in Engl. Pflanzenw. Ost–Afr. C: 85 (1895).

*Dryopteris sulcinervia* (Hieron.) C. Chr. Ind. Fil. 296 (1905).

*Diplazium sulcinervium* (Hieron.) C. Chr. in Perrier Cat. Pl. Madag. Pterid. 37 (1932).

Damp ravines in montane forest; 4,000 to 5,000 ft. alt.

**Fr.G.:** Tassakoidou & Kesseridou, Koniankes Chev. 20816 (K, P). **Br.Cam.:** Cam. Mt. Adams 1251 (BM); below Liwonge, Mann's Spring Richards 4313 (BM, K); Etunde, Cam. Mt. Maitland 1133 (K).

Also on E. African mountains.

5. *Diplazium proliferum* (Lam.) Kaulf. Enum. Fil. 182 (1824); Bonap. Notes Ptérid. 1 : 78 (1915).

Roux 2009: Accepted name

*Asplenium proliferum* Lam. Encycl. Méth. Bot. 2 : 307 (1786).

*Athyrium proliferum* (Lam.) Milde in Bot. Zeit. 353 (1870); Tard. in Mém. I.F.A.N. 28 : 163, t. 31, fig. 3, 4 (1953).

*Diplazium incisum* Schum. in K. Danske Vidensk. Selsk. 4 : 232 (1829).

*Diplazium serratum* Schum. l.c. 233.

*Asplenium decussatum* of Hook. Syn. Fil 243 (1867), partly, not of Sw.

**Fr.G.:** Loffa, Macenta Adam 3455 (P). **S.L.:** Roban Glanmlle 124 (K, NJ); Petema, Kenema Dist. T. S. Jones 317 (BM, N J); Gola Forest Small 674 (NJ), Bunting (BM). **Lib.:** Bilimu Harley 74 (K). **Iv.C.:** Assinie Chaper (ex Bonap.). **Ghana:** Asuansi Box 2858 (BM), 2045 (BM); Oda Box 2886 (BM), 2886a (BM); Krua, Kakum F.R. Box 2914 (BM); Puso Puso Ravine, Asiakwa Scholes 449 (BM); Bompata Vigne FH 2716 (K); Juaso, Ashanti Akpabla 238 (K); Amentia, Ashanti Irvine 439 (K); Bobiri F.R. Adams 543 (K). **Togo:** Buem Mischlich (BM). **S.Nig.:** Okomu F.R., Richards 3962 (BM, K), 3657 BM, (K.); Omo F.R., Tamajong FHI 20738 (BM, K), Jones & Onochie FHI 14724 (BM); Aboabam, Ikom Dist. Keay FHI 28179 (BM); Oban Dist. Talbot (K). **F.Po:** Mann (BM), 132 (K), Barter (K); Clarence Peak T. Vogel 130 (K).

Widespread in tropical Africa and Mascarene Islands.

## 25. LOMARIOPSIDACEAE

Epiphytic or terrestrial; rhizome wide (rarely short) creeping or climbing, dorsiventral in structure with roots arising from the ventral surface; leaf-bases more or less decurrent as ridges on the upper surface of the rhizome; apex of rhizome covered with scales which may be cordate but not peltate; stipes jointed near the base in *Elaphoglossum*, with several vascular strands arranged in a U. Fronds pinnate or simple, basiscopic edge of pinnae decurrent on the rhachis; veins free or anastomosing, areoles without free vein; fertile fronds acrostichoid. Sporangia with stalks of medium length. Annulus with about 14 cells. Spores monolete, with perispore.

- 1        Veins free and parallel; fronds never gemmiferous: 2  
          Veins reticulate; fronds often gemmiferous ----- 3. *Bolbitis*
  - 2        Stipes articulate above the base; fronds always simple        1. *Elaphoglossum*  
          Stipes not articulate; fronds pinnate or rarely simple (*Lomariopsis palustris*); scandent with wide-creeping  
          rhizomes ----- 2. *Lomariopsis*
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### 1. *ELAPHOGLOSSUM* Schott — Sim F.S.A. 284 (1915); Copel. Gen. 119 (1947).

- 1        Sterile fronds glabrous or with minute, peltate or stellate scales on the  
undersurface, margins not bordered with scales: 2  
          Sterile fronds fringed with spreading, deciduous scales, or the undersurface densely covered with scales: -- 6
- 2        Scales on undersurface minute, peltate or fronds glabrous; rhizome scales brown  
(except in No. 3): 3  
          Scales on undersurface stellate with long lobes, deciduous but usually present on the midrib; fronds oblong-linear;  
          stipes punctate, conspicuously articulate; rhizome scales linear-lanceolate, aristate, black ----- 5. *salicifolium*
- 3        Sterile fronds obtuse and rounded at apex; rhizome short-creeping; scales  
lanceolate, light brown; texture coriaceous 1. *conforme*  
          Sterile fronds subacute to long-acuminate: ----- 4
- 4        Rhizome short-creeping; stipes crowded; midrib without large scales, sometimes  
with small lacinate scales: 5  
          Rhizome wide-creeping; stipes rather distant, with scattered, ovate, subentire scales on midrib; texture  
          subcoriaceous; rhizome-scales pale brown, ovatelanceolate ----- 4. *preussii*
- 5        Stipes more than half as long as lamina; scales reddish brown; texture  
subcoriaceous 2. *isabelense*  
          Stipes less than half as long as lamina; scales turning blackish-brown; texture coriaceous ----- 3. *barteri*
- 6        Scales entire: 7  
          Scales strongly ciliate: ----- 10
- 7        Scales mainly on stipe, midrib and margin: 8  
          Scales evenly distributed over the frond, rusty-brown: ----- 9
- 8        Sterile fronds elongate-elliptic or broadly oblong, 2–6 cm. broad; scales black,

- deciduous      *6. hybridum*  
 Sterile fronds narrowly oblong, 1–2 cm. broad; scales brown, more persistent -----*7. aubertii*
- 9**      Scales lanceolate, regularly serrulate, usually numerous; stipe usually exceeding  
 blade      *8. cinnamomeum*  
 Scales hair-like, entire, usually few; stipe usually shorter than blade ----- *9. chevalieri*
- 10**      Rhizome short–creeping, with brown scales; scales mainly on lower surface of  
 frond      *10. kuhni*  
 Rhizome wide–creeping, with black scales; scales mainly on upper surface of frond --- *11. subcinnamomeum*

**1. *Elaphoglossum conforme* (Sw.) Schott** Gen. Fil. t. 14 (1834).

Roux 2009: Accepted name

*Acrostichum conforme* Sw. Syn. Fil. 10, 192, t. 1, fig. 1 (1806).

On trees.

**Lib.:** Bilimu Harley 186 (BM).

Also in S. Africa and St. Helena.

**2. *Elaphoglossum isabelense* Brause** in Engl. Bot. Jahrb. 53 : 432 (1915); Tard. in Mém. I.F.A.N. 28 : 106 (1953) partly.

Roux 2009: Accepted name

On trees in *Cyathea* woodland; 4,000 to 4,500 ft. alt.

**F.Po:** Mann (K), 370 (K); St. Isabel Peak Mildbr. 7117 (B); near Ilache Fall Adams 1075 (BM).

Also on S. Tomé and Príncipe.

**3. *Elaphoglossum barteri* (Bak.) C.Chr.** Ind. Fil. 303 (1905); Tard. l.c. 104, 1.17, fig. 1 (1953).

Roux 2009: Accepted name

*Acrostichum barteri* Bak. Syn. Fil. 519 (1874).

Epiphyte in forest; up to 4,300 ft. alt.

**Fr.G.:** Nimba Mts. Schnell 1117 (P). **S.L.:** Barter (K); Sugar Loaf Mt. T. S. Jones 337 (BM). **Lib.:** Bili Harley 212 (BM), 230 (BM); Bilimu Harley 187 (BM); Sanokwele Baldwin 9491 (K). **iv.C.:** Mt. Tonkoui Abbayes 587 (BM). **S.Nig.:** Brass Barter 1816 (K). **Br.Cam.:** path to Mann's Spring Adams 1675 (GC).

**4. *Elaphoglossum preussii* Hieron.** in Engl. Bot. Jahrb. 46 : 402 (1911); Tard. l.c. 106, t. 17, fig. 5, 6 (1953).

Roux 2009: Synonym of *Elaphoglossum acrostichoides* (Hook. & Grev.) Schelpe

*Elaphoglossum* sp. aff. *simplex* Christ in Denkschr. Schweiz. Naturf. Gen. 36 : 146

(1899).

Epiphyte in forest; up to 8,000 ft. alt.

**Br.Cam.:** Cam. Mt. Johnston 132 (BM), Cheesman (BM), Dunlap 230 (K), Preuss 937 (P); Onyanga Steele 59 (X.). **F.Po:** St. Isabel Peak Guinea 2939 (BM).

Also south to Natal (Schlechter 6917).

5. *Elaphoglossum salicifolium* (Willd. ex Kaulf.) Alston in Exell Cat. S. Tomé 92 (1944); Tard. l.c. 107, t. 17, fig. 7, 8, 9 (1953).

Roux 2009: Synonym of *Elaphoglossum lancifolium* (Desv.) C.V.Morton

*Acrostichum salicifolium* Willd. ex Kaulf. Enum. Fil. 58 (1824).

*Elaphoglossum viscosum* var. *salicifolium* (Willd. ex Kaulf.) Hieron. in Mildbr. Wiss. Ergebn. 1907–08, 2 : 35 (1910).

*Elaphoglossum petiolatum* var. *salicifolium* (Willd. ex Kaulf.) C.Chr. in Dansk. Bot. Ark. 7 : 168 (1932).

On rocks and trees in montane forest; 4,500 to 6,000 ft. alt.

**Fr.G.:** Nimba Mts. Schnell 397 (P), 1162 (P); Fouta Djallon Cattle 18130 (P). **Br.Cam.:** Mopanya Kalbreyer 141 (BM); Cam. Mt. Adams 1211 (BM), Migeod (BM), Rosevear R.F/141 (BM), Mildbr. 3460 (BM). **F.Po:** Mann 370a (K); near Moka L. Adams 1111 (BM).

Also on Mascarene Islands.

6. *Elaphoglossum hybridum* (Bory) Brack. U.S. Expl. Exped. 16 : 69 (1854), partly, excl. Brazilian plant.

Roux 2009: Accepted name

*Acrostichum hybridum* Bory Voy. Afr. 3 : 95 (1804).

**Br.Cam.:** Cam. Mts. Mann 1377 (K), Steele 108 (K). **F.Po:** Mann (BM), 663 (K).

Also in E. and S. Africa and Mascarene Islands.

7. *Elaphoglossum aubertii* (Desv.) Moore Ind. Fil. 5 (1857).

Roux 2009: Accepted name

*Acrostichum aubertii* Desv. in Mag. Ges. Naturf. Freunde Berl. 5 : 309 (1811).

Epiphyte, or on ground, in montane forest; about 6,200 ft. alt.

**Br.Cam.:** Mann's Spring Brennan 4213 (BM, K), Steele 107 (K). **F.Po:** Mann 662 (K); St. Isabel Peak Guinea 2944 (BM, K), Adams 1171 (BM).

Also in E. and S. Africa and the Mascarene Islands.

8. *Elaphoglossum cinnamomeum* (Bak.) Diels in E. & P. Pflanzenfam. 1, 4 : 333 (1899); Tard. l.c. 108 (1953), partly.

Roux 2009: Accepted name

*Acrostichum cinnamomeum* Bak. in Hook. Syn. Fil. 409 (Apr. 1868).

*A. mannianum* Mett. ex Kuhn Fil. Afr. 46 (1868), name only.

*Elaphoglossum mannianum* Mett. ex Christ in Denkschr. Schweiz. Naturf. Ges. 36 : 148 (1899).

*Acrostichum clarenceanum* Bak. in Kew Bull. 1896 : 42.

*Elaphoglossum clarenceanum* (Bak.) C.Christ. Ind. Fil. 304 (1905).

On trees; 3,000 to 6,000 ft. alt.

**Br.Cam.:** Cam. Mt. Johnston 139 (BM, K), Mann 2062 (K), Preuss 673 (ex Christ); near Mann's Spring Adams 1702 (BM). **F.Po:** Clarence Peak Mann 668 (K), Newton (K).

9. *Elaphoglossum chevalieri* Christ in Journ. de Bot. sér. 2, 2 : 23 (1909).

Roux 2009: Accepted name

*Acrostichum sejunctum* Kuhn Fil. Afr. 47 (1868), name only.

*Elaphoglossum clarenceanum* of Tard. in Mém. I.F.A.N. 28 : 108.

On trees; 2,400 ft. or more alt.

**Fr.G.:** Nimba Mts. Portères (P), Schnell 396 (P), 2983 (P), 3678 bis (P); Ziama Schnell 2709 (P), Adam 4115 (P). **S.L.:** Barter (K); Picket Hill T. S. Jones 331 (BM, NJ); Sugar Loaf Mt. T. S. Jones 335 (BM, NJ). **Lib.:** Mt. Bili Barker 1172 (BM); Bilimu Harley 189 (BM), 1984 (BM, K). **Iv.C.:** Mt. Tonkouli Abbayes 571 (BM), Schnell 1751 (P).

Also in **S. Tomé**.

10. *Elaphoglossum kuhnii* Hieron. in Engl. Bot. Jahrb. 46 : 399 (1911); Tard. in l.c. 107 (1953).

Roux 2009: Accepted name

*Elaphoglossum camerouniense* Tard. in Bull. Et. Cam. 2 : 92 (1949).

*Acrostichum squamosum* of Hook. Syn. Fil. 411 (1866), partly.

*Elaphoglossum squamosum* of Christ in Denkschr. Schweiz. Naturf. Ges. 36 : 147 (1899), partly as to S.L. plant.

Epiphyte in montane forest; up to 7,000 ft. alt.

**S.L.:** Kru Mts. Barter 1133 (BM); Sugar Loaf Mt. Barter (K). **Lib.:** Kubo Baldwin 11422 (K). **Br.Cam.:** Cam. Mt. Mann 1378 (K), Adams 1317 (BM), Rosevear RF/40 (BM); Mann's Spring Brennan 4212 (K), 4354 (K); Tongo Maitland 1051 (K); Moliwe Schlechter 15790 (ex Hieron.); near L. Bambulue Morton K. 288 (GC). **F.Po:** Clarence Peak Newton (K); St. Isabel Peak Adams 1173 (BM).

Also in **French Cameroons**.

11. *Elaphoglossum subcinnamomeum* (Christ) Hieron. Engl. Bot. Jahrb. 46 : 401 (1911); Tard. in Mém. I.F.A.N. 28 : 107, t. 17, fig. 10, 11 (1953).

Roux 2009: Accepted name



*Elaphoglossum mannianum* var. *subcinnamomeum* Christ in Denkschr. Schweiz. Naturf. Ges. 36 : 140 (1899).

On rocks in open grassland; 9,500 to 11,000 ft. alt.

**Br.Cam.:** Cam. Mt. Preuss 842 (ex Christ & Hieron.), Adams 1333a (BM), Keay FHI 28613 (BM); Vefordi, Mann's Spring Richards 4355 (BM, K).

Also on Mts. Kenya and Kilimanjaro.

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## 2. *LOMARIOPSIS* Fée — Copel. Gen. 117 (1947).

- 1 Sterile fronds always simple; fertile normally simple *1. palustris*  
Sterile fronds pinnate when mature: ----- 2
- 2 Fertile pinnae with a sterile tip, less than 6 mm. long; sterile rhachis subulate; sterile pinnae cuneate at base, stalked, abruptly acuminate; scales brown, not shining; spores almost smooth, with a few spines *2. guineensis*  
Fertile pinnae entirely fertile, not caudate: ----- 3
- 3 Fertile rhachis not scaly: 4  
Fertile rhachis scaly; pinnae rather narrow and close together and truncate at base: ----- 6
- 4 Pinnae narrow, oblique, rather distant, 14–jugate, up to 1.6 cm. broad *3. nigrescens*  
Pinnae broader, 10–12–jugate, up to 3.7 cm. broad; spores with convolute perispore: ----- 5
- 5 Scales narrow; rhizome warted (after fall of scales); young fronds entire; rhachis not winged in adult plant; terminal pinna 1 1/2 times as long as lateral pinnae *4. muriculata*  
Scales broad; rhizome smooth; young fronds pinnate; sterile pinnae rounded at base, abruptly acuminate, upper part of rhachis winged; terminal pinna similar to lateral pinnae ----- *5. rossii*
- 6 Pinnae gradually decreasing towards the base of the frond; up to 3 cm. long *6. decrescens*  
Pinnae at most slightly decrescent towards the base of the frond: ----- 7
- 7 Fertile pinnae up to 15 cm. long *7. mannii*  
Fertile pinnae up to 7.5 cm. long ----- *8. hederacea*

1. *Lomariopsis palustris* (Hook.) Mett. ex Kuhn Fil. Afr. 53 (1868); Tard. in Mém. I.F.A.N. 28 : 99, t. 16, fig. 1, 2 (1953).

Roux 2009: Accepted name

*Acrostichum palustre* Hook. Spec. Fil. 5 : 214 (1864); Syn. Fil. 402 (1868).

*Elaphoglossum palustre* (Hook.) J. Sm. Ferns Brit. & For., ed. 2 : 298 (1877); Christ in Denkschr. Schweiz. Naturf. Ges. 36; 147 (1899).

On rocks and trees in swamp and fringing forest; mostly at low elevations.

**Fr.G.:** Kakoulima Nikl & Graves (P); Nimba Mts. Schnell 1110 (P). **S.L.:** Barter (K); Mahnoo Mair (K); Nicol Brook, Freetown Johnston 43 (K). **Lib.:** Beidin Harley 198 (BM, K); Gbanga Linder 746 (K);

**Iv.C.:** Agbo Chev. 16612 (P). **Ghana:** R. Kakum Asuansi Box 2482 (BM), 2884 (BM); Puso Puso Ravine Adams 499 (K). **S.Nig.:** Omo (formerly part of Shasha) F.R., Jones & Onochie FHI 16081 (BM), Richards 3239 (BM), 3418 (BM), Ross 31 (BM); Okomu F.R., Richards 3685 (K); Ajagbodudu, Benin Wright 12 (K); Onitsha Barter 1452 (K). **Br.Cam.:** Cam. Mt. Barter (ex Tard.); Amba Bay Mann 785 (K); Victoria Thorold 5 (K).

Also south to Angola.

2. *Lomariopsis guineensis* (Underw.) Alston in J. Bot. 72, Suppl. 2 : 5 (1934); Tard. l.c. 101,t.16, fig. 6 (1953).

*Stenochlaena guineensis* Underw. in Bull. Torr. Bot. Club. 33 : 46, fig. 3 (1906); Engl. Pflanzenw. Afr. 2 : 33, fig. 28 (1908).

*Acrostichum sorbifolium* of Hook. Syn. Fil. 412 (1868), partly, not of Linn.

Climbs on trees in forest; the rhizomes are flattened and attached by the roots like ivy; at low elevation.

**Fr.G.:** Seringbara Schnell 1163 (P), 1179 (P); Mt. Nlmba Schnell 1100 (P), 1422 (P). **S.L.:** Pujehun Deighton 270 (BM, NJ); Mahnoo Mair (K). **Iv.C.:** Mt. Noubu Chev. 21132 (P). **Ghana:** Axim Irvine 2241 (K); Kumasi Cummins 221 (K); Asuansi Box 2035 (BM), Scholes 276 (BM); Kibi Johnson 243 (K); Bekwai Box 2896 (BM); Bompata Vigne FH 2714 (K). **Togo:** Kabi River F.R., St. C. Thompson 1695 (K); Misahöhe Mildbr. 7359 (K). **Dah.:** Niaouli, Allada Chev. 23413 (P). **S.Nig.:** Haro F.R., Onochie FHI 3431 (BM); Omo (formerly part of Shasha) F.R., Richards 3178 (BM), 3240 (BM), Jones & Onochie FHI 16745 (BM); Sapoba F.R., Jones FHI 3670 (BM); Okomu F.R., Richards 3943 (BM, K), 3709 (BM, K); Ajagbodudu, Benin Wright 13 (K); Bateria, Ogoja Prov. Savory & Keay FHI 25273 (BM). **Br.Cam.:** Mamfe Baldwin 13827 (BM); Victoria Kalbreyer 25 (BM); Likomba Mildbr. 10590 (K); Etam, Kumba Rosevear (BM). **F.Po:** Barter 1462 (K), Mann 139 (K); carretera de S. Carlos Guinea 734 (BM).

Also in S. Tomé, the Sudan and south to Angola.

3. *Lomariopsis nigrescens* Holtt. in Kew Bull. 1939 : 627, fig. 13,14.

Roux 2009: Synonym of *Lomariopsis warneckei* (Hieron.) Alston

**F.Po:** Mann(K).

[Holttum mentions a specimen collected by Barter, which may also have been from F. Po.]

4. *Lomariopsis muriculata* Holtt. l.c. 624 (1939).

Roux 2009: Accepted name

**S.Nig.:** R. Nun Barter 20, 110 (BM, K); Boje, Afi River F.R., Ikom Jones & Onochie FHI 18647 (BM).

Also in Belgian Congo.

[A sterile specimen from Sierra Leone (*Whitfield* in Mooré's Herbarium at Kew) seems to be near this species.]

5. *Lomariopsis rossii* Holtt. 625 (1939); Tard. in Mém. I.F.A.N. 28 : 101,t.16, fig. 3 (1953).

Roux 2009: Accepted name

On ground or on trunks of trees in forest; mainly at low levels.

**Fr.G.:** Nimba Mts. Schnell 1110 (P). **Lib.:** Ganta Harley 26 (BM, K). **Iv.C.:** Mt. Copé Chev. 19690 (P); Toulépleu Schnell 1256 (P). **Ghana:** Nfuom, Kakum F.R., Box 2938a (BM), 2938 (BM); Puso Fuso Adams 74 (BM). **S.Nig.:** Okomu F.R., Richards 3600 (BM, K), 3891 (BM, K), 3709a (K), 3896 (K); Omo (formerly part of Shasha) F.R., Jones & Onochie FHI 16082 (BM), Ross 22 (BM). South to Belgian Congo (Callens 4044).

6. *Lomariopsis decrescens* (Bak.) Kuhn in Verh. Zool. Bot. Ges. 19 : 571 (1869); Tard. l.c. 102 (1953).

Roux 2009: Accepted name

*Acrostichum decrescens* Bak. in Hook. Syn. Fil. 412 (1868).

*Stenochlaena decrescens* (Bak.) Underw. in Bull. Torr. Bot. Club 33 : 46, fig. 5 (1906).

**S.Nig.:** Ofunte B., Obudu Div. Savory & Keay FHI 25254 (BM). **Br.Cam.:** Preuss 591 (BM); Cam. Mt. Mann 1391 (K). **F.Po:** St. Isabel Peak Adams 1154 (BM, K).

7. *Lomariopsis mannii* (Underw.) Alston in J. Bot. 72, Suppl. 2 : 6 (1934); Tard. l.c. 102 (1953).

Roux 2009: Accepted name

*Stenochlaena mannii* Underw. l.c. 47, fig. 2 (1906).

On rocks and trees in forest; 3,000 to 5,000 ft. alt.

**Br.Cam.:** Mopanya Kalbreyer 188 (BM, K); Cam. Mt. Johnston 146 (K); Buea to Musake Maitland 1226 (K). **F.Po:** Mann 354 (K), 446 (K).

8. *Lomariopsis hederacea* Alston l.c. 5 (1934); Tard. l.c. 102, t. 16, fig. 4 (1953).

Roux 2009: Accepted name

On trees; at about 1,000 ft. alt.

**F.Po:** Barter (K), Mann (K), 374 (K), 144 (K).

Also in S. Tomé, Principe, Ubangi and south to Angola.

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3. *BOLBITIS* Schott — Alston in J. Bot. 77 : 283 (1939); Copel. Gen. 115 (1947).

- |   |  |    |
|---|--|----|
| 1 | Terminal pinnae lobed, or fronds simple:   | 2  |
|   | Terminal pinnae not lobed, rhizome short–creeping:   | 5  |
| 2 | Gemmae present, borne at apex of frond; fronds always simple, lanceolate, conspicuously pinnately nerved, with the lateral veins connected by transverse curved veins and filled with a network of irregular areoles; rhizome short–creeping |    |
|   |  | 1. |
- gaboonensis*

Gemmae wanting: ----- 3

3 Fronds simple or pinnatifid without transverse veins connecting the lateral veins, but irregularly areolate; rhizome short–creeping 2. *fluviatilis*

Fronds pinnate; rhizome wide–creeping: ----- 4

4 Lateral veins rather prominent; pinnae 2–6 pairs, up to 3.7 cm. broad 3. *auriculata*

Lateral veins not prominent; pinnae about 10 pairs in mature plants, up to 1.8 cm. broad; submerged fronds transparent and bipinnatifid ----- 4. *heudelotii*

5 Gemmae borne at base of terminal pinna; pinnae 4–9 pairs, with terminal pinna similar to lateral pinnae 5. *gemmifera*

Gemmae borne at the apex of the terminal pinna, which is often longer than the lateral pinnae: ----- 6

6 Lateral veins prominent; pinnae about 2.5 cm. across, abruptly truncate or cuneate at base 6. *acrostichoides*

Lateral veins not prominent; pinnae usually about 1.2 cm. across, attenuate at base ----- 7. *salicina*

1. *Bolbitis gaboonensis* (Hook.) Alston in J. Bot. 72, Supp. 1 : 3 (1934); Tard. In Mém. I.F.A.N. 28 : 109, t. 18, fig. 1 (1953).

Roux 2009: Accepted name

*Acrostichum gaboonense* Hook. Spec. Fil. 5 : 270 (1864).

Terrestrial, in forest.

**S.Nig.:** Omo F.R., Ijebu Ode Jones & Onochie FHI 17514 (BM, K). **Br.Cam.:** Johann–Albrechtshöhe Staudt 449 (K).

Also south to Angola.

2. *Bolbitis fluviatilis* (Hook.) Ching in C.Ch. Ind. Fil. Suppl. 3 : 48 (1934); Tard. l.c. 110, t. 18, fig. 4, 5 (1953).

Roux 2009: Accepted name

*Acrostichum fluviatile* Hook. Spec. Fil. 5 : 274 (1864).

On rocks in streams in forest; 1,500 ft. alt.

**Lib.:** Linder (K); N. of Beidin Harley F. 152 (BM); Bilimu Harley 76 (K); Mt. Bili Barker 1170 (K).

**Ghana:** Burton & Cameron (K); Puso Puso Ravine Adams 331 (BM), 415 (BM, K), 3851 (BM).

**Br.Cam.:** Njoke to Malende Schlechter 12874 (BM, K). **F.Po.:** Mann 442 (K); Mt. Balea Guinea 416 (BM).

Also south to the Congo.

3. *Bolbitis auriculata* (Lam.) Alston l.c. (1934); Tard. l.c. 112, t. 18, fig. 6–8 (1953).

Roux 2009: Accepted name

*Acrostichum auriculatum* Lam. Encycl. Méth. Bot. 1 : 36 (1783).

Terrestrial, in high forest, fringing forest or *Raphia* swamps.

**Fr.G.:** Nimba Mts. Adam, 3248 (P), 7481 (P), Schnell (P). **S.L.:** Kalu Yeyei, Pendembu Dawe 534 (K). **Lib.:** Bilimu Harley F. 180 (BM), 114a (K). **Iv.C.:** Mt. Oroumba Boka Abbayes 438 (BM). **Ghana:** Asuansi Box 2431 (BM), 2478 (BM), 2857 (BM); Fuso–Juaso F.R., Scholes 257 (BM), Box 2068a (BM); Achiasi, S. of Oda Box 2889 (BM); New Tafo Lovi (BM), Donald 18 (BM); Asuansi Lovi 19 (BM); Akropong, Akwapim Irvine 2615 (K). **Togo:** Amedzofe Scholes 67 (BM). **N.Nig.:** Kurmin Damisa, Jemaa Keay & Onochie FHI 21730 (BM). **S.Nig.:** Omo (formerly part of Shasha) F.R., Richards 3242 (BM), 3393 (BM); Okomu F.R., Richards 3942 (BM, K), 3881 (BM, K), 3316 (BM); Onitsha Barter 1451 (K). **Br.Cam.:** Victoria Kalbreyer 24 (BM); Johann–Albrechtshöhe De Gironcourt 404, Staudt 463 (both ex Tard.). **F.Po:** Mann (BM), 133 (K), Barter (K); Musola Guinea 1222 (BM).

East to Uganda and south to the Congo.

4. *Bolbitis heudelotii* (Bory ex Fée) Alston l.c. (1934); Tard. l.c. 112,t.19, fig. 1,2 (1953).

Roux 2009: Accepted name

*Gymnopteris heudelotii* Bory ex Fée Acrost. 84, t. 45 (1845).

*Campium angustifolium* Copel. in Phil. Journ. Sci. 37 : 49, fig. 47 (1928).

*Bolbitis felixii* Tard. in Notulae Syst. 13 : 169 (1948).

Spray–soaked rocks near streams and waterfalls, often submerged.

**Fr–Sud.:** Boufara, Banan Chev. 529 (P); Fincolo Chev. 756 (P). **Fr.G.:** Hb. Greville (BM), Heudelot 805 (K, OXF); Fassakoidou Chev. 20798 (K); Macenta Jac.–Fél. 933 (P). **S.L.:** Don (BM), Purdie (BM); Mawele Deighton 4811 (K., NJ); Loma Mts. Jaeger 268 (NJ); Tanmakim, Bumpe Deighton 1696 (BM, K, NJ); Mt. Horton T. S. Jones 295 (BM, K, NJ); Regent to Bathurst Johnston (BM), 89 (K); Freetown Barter (K). **Iv.C.:** Bépleu Cascade, Man Abbayes 593 (BM). **Ghana:** R. Kakum, Asuansi Box 2082 (BM), 2083 (BM); Achiasi, S. of Oda Box 2892 (BM); Kintampo Dalz. 73 (K). **Togo:** Buén Mischlich (BM); Misahöhe Mildbr. 7380 (K). **Dah.:** Atacora Mts. Chev. 24171 (P). **S.Nig.:** Boje, Afi River F.R., Ikom Jones & Onochie FHI 18601 (BM); Kundeve, Obudu Div. Savory & Keay FHI 25137 (BM); Bebi, R. Ata, Obudu Savory & Keay FHI 25012 (BM); British Obokum Keay FHI 28286 (BM, K). **Br.Cam.:** Victoria Bot. Gdn. Richards 4020 (BM, K).

Also south to Angola.

5. *Bolbitis gemmifera* (Hieron.) C.Chr. Ind. Fil. Suppl. 3 : 48 (1984); Tard. in Mém. I.F.A.N. 28 : 113,t.19, fig. 3 (1953).

Roux 2009: Accepted name

*Leptochilus gemmifera* Hieron. in Engl. Bot. Jahrb. 46 : 845 (1911).

*Bolbitis guineensis* Tard. in Notulae Syst. 13 : 170 (1948).

Terrestrial in forest, at low levels.

**Fr.G.:** Nzérékoré Jac.–Fél. 1147 (F); Dyeke Baldwin 9660 (K). **S.L.:** Smeathmann (BM); Dumbuma Deighton 6019 (K); Manabi Thomas 4549 (K); Mahnoo Mair (K); Tabe to Jama Deighton 3028 (K, NJ). **Lib.:** Ganta Harley 86 (BM), 15 (K); Bilimu Harley 120 (K). **Iv.C.:** (ex Tard.). **Ghana:** Foso–Juaso F.R. Box 2068 (BM); Asuansi Box 2883 (BM); Mielealuma, Axim Cudjoe 45 (K); Mampong, Ashanti Foote 2 (BM). **Br.Cam.:** Johann–Albrechtshöhe Staudt 463 (ex Tard.).

South to Angola and east to Tanganyika.

6. *Bolbitis acrostichoides* (Afzel. ex Sw.) Ching in C. Chi. Ind. Fil. Suppl. 3 : 47 (1934); Tard. in Mém. I.F.A.N. 28 : 115, t. 19, fig. 4 (1953).

Roux 2009: Accepted name

*Hemionitis acrostichoides* Afzel. ex Sw. in Schrad. Journ. für Bot. 1800 2 : 17 (1801).

*Acrostichum afzelii* Carruth. in Cat. Welw. 2, 2 : 277 (1901).

On rocks in finest; op to 3,200 ft. alt.

**Port. G.:** Bula, Québu Esp. Santo 2480 (LISC, LISJC). **Fr.G.:** Heudelot 702 (K), 902 (OXF); source of the Niger Jaeger 138 (NJ); Los Isl. Belcher (BM), Mugnier–Serand (K). **S.L.:** Afzelius fflM), Don (BM), Barter (BM); Sugar Loaf Mt. T. S. Jones 348 (BM, NJ); Bintumane T. S. Jones 11 (BM, NJ); Nicol Brook Johnston (BM), 28 (K); Botumba Isl. Kirk 20 (K); Kambia, Magbema Jordan 876 (K). **Lib.:** Bilimu Harley 56 (BM, K), 77 (K); Ganta Harley 168 (BM, K), 12 (K); Mt. Bili Barker 1158 (K). **Iv.C.:** Agnéby to Bia Gros (K). **Ghana:** Nfuom, Kakum F.R., Box 2853 (BM), 2854 (BM), 2859 (BM), 2864 (BM), 2867 (BM); Mampong Box 2906 (BM), Vigne FH 4104 (K); New Tafo Lovi 32 (BM); Begoro, Akim Irvine 1179 (K), Adams 427 (K). **N.Nig.:** Kurmin Ninte, Jemaa Keay FHI 22253 (BM); Kurmin Damisa, Jemaa Keay & Onochie FHI 21549 (BM); Patti Lokoja Elliott 31 (K), Dalz. 242 (K). **S.Nig.:** Onda stream, Omo F.R. Jones & Onochie FHI 16953 (BM, K); Akure F.R., Keay FHI 25481 (BM); Okomu F.R., E. W. Jones 3965 (BM, K); Idanre Richards 3735 (BM, K); Boje, Afi River F.R., Ikom Jones & Onochie FHI 18744 (BM). **Br.Cam.:** Uanda Kalbreyer 160 (BM); Johann–Albrechtshöhe Staudt 463 (BM, K); Mile 97 on Kumba–Mamfe Road Adams 1509 (BM), **F.Po:** Barter (K).

Also south to Angola and east to Madagascar.

7. *Bolbitis salicina* (Hook.) Ching l.c. 50 (1934); Tard. l.c. 116, t. 19, fig. 5 (1953).

Roux 2009: Accepted name

*Acrostichum saticinum* Hook. Spec. Fil. 5 : 265 (1864).

On rocks near streams; up to 3,500 ft. alt.

**Fr.G.:** Dalaba, Fouta Djallon Abbayes 798 (BM). **S.L.:** Barter (K), Bon (BM); Mt. Horton T. S. Jones 352 (BM). **Lib.:** Beidin Harley 159 (BM, K); Gene, Gola Forest Bunting (BM); near Mt. Coffee Cook 66 (BM). **Iv.C.:** Tonkouli Portères (P); Mt. Dou, Portères(P). **Ghana:** Chirano, Sifuri Adams GC 3877 (BM, K). **S.Nig.:** Oban Talbot (BM); R. Nwup, N. of Boje, Afi River F.R., Ikom Jones & Onochie FHI 18931 (BM); Mile 58, Calabar–Mamfe Road Baldwin 13763 (BM). **F.Po:** Mann 133 ? (K), Henderson (K).

Also south to Belgian Congo.

## 26. ASPIDIACEAE

Roots with, a sclerenchymatous sheath; rhizome suberect or creeping, scaly at apex; scales not clathrate, brown to black. Fronds pinnate, bipinnate or more simply divided; stipes with several small vascular bundles, not jointed at base; pinna—supply extra-marginal or marginal; pinnules usually unequal-sided at base; veins free or anastomosing. Sori on veins or at vein-tips, or compital, round or slightly elongate, usually with a reniform or peltate indusium. Sporangia with stalks of medium length, about 4 cells long, sometimes with, glands on the pedicels. Annulus with 14–30 cells. Paraphyses none (in W. African species). Gametophyte usually with hairs.

- 1 Costae with raised edges, or if dimidiate, secondary rhachides with raised edges; veins pinnate; fronds bipinnate; sori punctate usually with a kidney-shaped or peltate indusium; rhizomes stout short-creeping, or erect (*Dryopteridoideae*): 2  
Costae without raised edges; veins pinnate or anastomosing; sori punctate with or without indusia, or covering the whole undersurface; rhizomes creeping or suberect (*Tectarioideae*): ----- 4
- 2 Pinnules jointed to the rhachis, dimidiate; sori longer than broad; stock massive, erect, like a small tree-fern; fronds about 1.2 m., bipinnate, small spines in furrow at base of leaflet 1. *Didymochlaena*  
Pinnules not jointed to the rhachis or dimidiate; sori round, no small spines at the bases of the leaflets: ----- 3
- 3 Indusia reniform; teeth on margin of lamina without aristae 2. *Dryopteris*  
Indusia peltate; teeth on margin of lamina aristate ----- 3. *Polystichum*
- 4 Veins normally free; fronds mostly finely dissected, but some pinnate 4.  
*Ctenitis*  
Veins normally anastomosing; fronds pinnate, with pinnae more or less lobed ----- 5. *Tectaria*

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### 1. *DIDYMOCHLAENA* Desv. — Sim F.S.A. 112 (1915); Copel. Gen. 112 (1947).

Terrestrial fern with erect short trunk-like scaly rhizome and rhachis; fronds bipinnate with dimidiate, trapeziform, articulate pinnules; basal margin of pinnules thickened; veins free; sori oblong, terminal outer veins nearer the margin than the midrib; indusium attached in the centre and at the base, free at the sides and apex.

*Didymochlaena Truncatula* (Sw.) J. Sm. in Hook. Journ. Bot. 4 : 196 (1841).

Roux 2009: Accepted name

*Aspidium truncstulum* Sw. in Schrad. Journ. für Bot. 1800, 2 : 36 (1801).

*Didymochlaena lunulata* Desv. in Mém. Soc. Linn. Par. 6 : 282 (1829); Hook. Gard. Fern. t.17 (1862); Syn. Fil. 248 (1867).

*Didymochlaena microphylla* of Tard. in Mém. I.F.A.N. 28 : 153 (1953).

Terrestrial in forest; 4,000 to 5,000 ft. alt.



**Br.Cam.:** Cam. Mt. Johnston 148 (BM), Maitland 1132 (K), Mann 1401 (X), Annet 117 (P); below liwonge, Mann's Spring Richards 4252 (BM, K). **F.Po:** Mann (BM, K), 356 (K); Monkey Bush to Musola Guinea 1038 (BM); L. Loretto, Moka Adams 1014 (BM).

Pantropical.

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## 2. *DRYOPTERIS* Adans. — Copel. Gen. 121 (1947).

1 Rhachis furnished with narrow, dark, stiff, spreading scales; pinnules truncate at apex *1. squamiseta*

Rhachis with only soft brown scales: ----- 2

2 Fronds oblong–lanceolate, bipinnate: 3

Fronds narrowly oblong, bipinnatifid, short–stalked; rhizomes suberect with narrow scales; indusia persistent; not gemmiferous ----- *5. schnellii*

3 Pinnules obliquely cuneate at base, subacute at apex, without acute teeth; rhizome prostrate, thick with narrow, dark brown, entire scales; texture coriaceous, veins impressed; indusia persistent; basal pinnae stipitate; sori medial; rhachides with few scales *2. athamantica*

Pinnules truncate at base; rhizomes suberect; basal pinnae not stipitate; texture herbaceous, veins often raised: 4

4 Indusia wanting; basal pinnae not stipitate; texture membranaceous; scales pale brown, ovate–elliptic; gemmae usually present; veins conspicuous; acute teeth on side and apices of pinnae; teeth mostly obtuse; sori submedial; rhachides with few scales

*3. manniana*

Indusia persistent; scales lanceolate; gemmae wanting; teeth acute, mainly near apices of lobes; sori costular; rhachides scaly ----- *4. pentheri*

1. *Dryopteris squamiseta* (Hook.) O. Kuntze Rev. Gen. 2: 813 (1891); C.Chr. in Dansk. Bot. Ark. 7: 55 (1932); Tard. in Mém. I.F.A.N. 28: 149, t. 29, fig. 1–3 (1953).

Roux 2009: Synonym of *Nothoperanema squamiseta* (Hook.) Ching

*Nephrodium squamisetum* Hook. Sp. Fil. 4: 140, t. 268 (1862).

*N. buchanani* Bak. Syn. Fil. 498 (1874); in Hook. Ic. PL. t. 1662 (1886).

*Dryoptens buchanani* (Bak.) O. Kuntze Rev. Gen. Fl. 2: 812 (1891); Sim F.S.A. 108, t. 20 (1915).

On ground; at 4,000 ft. alt.

**F.Po:** Clarence Peak, 4,000 ft. Mann 380 (K).

Also in eastern Africa from the Sudan (Macleay 261) south to Natal.

2. *Dryopteris athamantica* (Kunze) O. Kuntze Rev. Gen. Pl. 2: 812 (1891); Sim F.S.A. 107, t. 19 (1915); Tard l.c. 151, t. 29, fig. 7 (1953).

Roux 2009: Accepted name



*Aspidium athamanticum* Kunze in Linnaea 18: 123(1844).

*Nephrodium athamanticum* (Kunze) Hook. Spec. Fil. 4 125, t. 258 (1862).

Terrestrial on banks and forest margins; 3,500 to 5,500 ft. alt.

**Fr.G.:** Dalaba, Fouta Djallon Abbayes 657 (BM). **S.L.:** Bintumane T. S. Jones 7 (BM, NJ), 21 (BM).

**N.Nig.:** Naraguta Lely 306 (K). **Br.Cam.:** Mile 42, Bamenda–Wum Road Savory UCI 342 (BM); Mile 17 on Bamenda–Ndop Road Adams 1564 (BM); Busu, Bamenda Maitland 1736 (K); Sagbo, near Ndop, Bamenda Adams 1543a (BM).

Also southwards to Natal.

3. *Dryopteris manniana* (Hook.) C.Ch. Ind. Fil. 276 (1905); Tard. l.c. 149, t. 29, fig. 4, 5 (1953).

Roux 2009: Accepted name

*Polypodium mannianum* Hook. Spec. Fil. 4: 253 (1862).

At 2,000 to 4,400 ft. alt.

**Fr.G.:** Nimba Mts. Schnell (P), 258 (P); Mt. Nzo Chev. 21076 (P). **Iv.C.:** Mt. Tonkoui Portères (P).

**S.Nig.:** R. Ata, below Mt. Koloishe, Obudu Savory & Keay FHI 25063 (BM); Ikwette–Baleghete path, Obudu Savory & Keay FHI 25204 (BM). **F.Po:** Mann 351 (K).

4. *Dryopteris pentheri* (Krasser) C.Ch. Ind. Fil. 284 (1905).

Roux 2009: Accepted name

*Nephrodium pentheri* Krasser in Ann. Hofmus. Wien 15: 5, t. 2, fig. 1–5 (1900).

Terrestrial margin of forest; 6,000 to 10,000 ft. alt.

**Br.Cam.:** Cam. Mt. Keay FHI 28628 (BM), 28604 (BM), Johnston (BM), Adams 1269 (BM), Maitland 1046 (K), Mann 2053 (K), 1369 (K); Buea Mildbr. 20876 (K), 10854 (K); Nyanga Camp, Meyer crater Maitland 1214 (K); near Mann's Spring Richards 4249 (BM, K), 4381 (BM). **F.Po:** Mann (BM, K): St. Isabel Peak Guinea 2769 (BM), 2771 (K).

Generally distributed in tropical and S. Africa.

5. *Dryopteris schnellii* Tard. in Notulae Syst. 13: 370 (1948).

Roux 2009: Synonym of *Athyrium newtonii* Baker

. *Dryopteris huberi* Christ in Ann. Mus. Congo sér. 5, 3: 26 (1909), partly, excl. Brazilian plant.

*Athyrium newtonii* of Tard. in Mém. I.F.A.N. 28: 163, t. 30, fig. 1, 2 (1953), not of Bak.

**Fr.G.:** near Nzo Schnell 1499 (P).

Also in Belgian Congo (Seret 865).

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3. *POLYSTICHUM* Roth — Sim F.S.A. 114 (1915); Copel. Gen. 108 (1947).

Terrestrial ferns with short ascending scaly caudex; stipes clustered; fronds bipinnate with firm texture and mucronate teeth, veins free; sori dorsal on the veins, round, indusium peltate; spores verrucose or spinulose.

*Polystichum fuscopaleaceum* Alston in Bol. Soc. Brot., sér. 2A, 30: 22 (1956).

Roux 2009: Synonym of *Polystichum sinense* (H.Christ) H.Christ

*Aspidium aculeatum* Hook. Spec. Fil. 4: 19 (1862), partly, as to F.Po plant, not of Sw.

On ground in rocky wooded gullies in grassland; 7,000 to 11,000 ft. alt.

**Br.Cam.:** Cam. Mt. Keay FHI 28602 (BM), 28612 (BM), Migeod 190 (BM, K), Adams 1281 (BM), Johnston 113 (BM), Mann B. 76 (K), 2067 (K), Dunlap 226 (K), Mildbr. 10883 (K); near Mann's Spring Richards 4282 (BM, K), Mann 133 (K); Bamenda Migeod 383 (BM, K). **F.Po:** Mann (BM, K), 340 (K).

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4. *CTENITIS* C.Chr. (1938) — Copel. Gen. 123 (1947).

1 Fronds pinnate with pinnae lobed almost to the costa; venation of lobes pinnate; clathrate scales on costae below; many short, articulate, white, appressed hairs on lamina; spores covered with wart-like spines *1. cirrhosa*

Fronds decompose or if pinnate not deeply lobed (No. 9); veins forked, or simple: ----- 2

2 Fronds pinnate, tripartite, or pedate, light green; rhizome wide-creeping; indusia usually present; all hairs multicellular; no multicellular glands: 3

Fronds bipinnate to quadripinnate; rhizome stout, suberect or short-creeping: ----- 11

3 Fronds bipinnate or tripinnate; veins normally free (with occasional anastomoses in No. 7): 4

Fronds pinnate; veins copiously anastomosing; surface of lamina glabrous; costa glabrous above; indusia small, caducous; sori dorsal on veins ----- 9. *buchholzii*

4 Surface of lamina pubescent; rhachis with long hairs; rhizome relatively slender with stipes widely spaced: 5

Surface of lamina glabrous; rhachis shortly puberulous: ----- 6

5 Costae glabrous above; rhachis sparingly pubescent; indusia pilose; fronds bipinnate; scales black with thickened walls in lower half *2. vogelii*

Costae with long, scattered hairs on the upper surface; rhachis with densely matted pubescence; indusia glabrous or with subsessile glands on margins; fronds tripinnate; scales dull olive-brown, without thickened walls *3. lanigera*

6 Costae with scattered hairs on upper surface: 7

Costae glabrous above; indusia glabrous: ----- 9

7 Sori all terminal on veins; indusia large, persistent; pinnules cuneate at base with winged petiolules; veins not conspicuous below; fronds drying black *4. pilosissima*

Sori mostly dorsal on the veins: ----- 8

8 Indusia small, caducous; pinnules adnate-decurrent; frond dark green *5. protensa*

Indusia large, subsistent; pinnules obliquely truncate; veins conspicuous below ----- 6. *speciosa*

9 Fronds bipinnate, deltoid or triangular in outline; segments mostly adnate and

broadly decurrent; bulbils sometimes present on rhachis or replacing sori; ultimate pinnules with central costae; rhizome slender, wide-creeping; sori supra-medial 7.

*jenseniae*

Fronds pedate, with 5 or rarely 3, simply pinnate branches; rhizome stout, short-creeping; sori submedial; pinnules trapezoid with oblique costae: -----10

10 Pinnules 3.5 cm. long 8. *securidiformis* var. *securidiformis*

Pinnules less than 2 cm. long -----8a. *securidiformis* var. *nana*

11 Rhachides without gemmae: 12

Rhachis normally with a gemma near the apex; spores sinuate-alate: Sori round; short red jointed hairs usually present: -----13

12 Indusia present; spores minutely spinulose; costae villous with rather short multicellular hairs 10. *lanuginosa*

Indusia wanting; spores alate; costae villous with multicellular hairs; sessile red glands on lamina 11. *barteriana*

13 Costae villous below 12. *pubigera*

Costae glabrous or sparsely pubescent below: -----14

14 Sori large; yellow glands few; costae sparsely pubescent below 13. *subcoriacea*

Sori smaller; costae glabrous: -----15

15 Appressed yellow glands abundant; rhachis tomentellous below 14. *efulensis*

Appressed yellow glands few or wanting; rhachis glabrous below -----15. *nigritiana*

16 Sori elongate, exindusiate; rhizome prostrate; surface usually eglandular; costae with short hairs on upper surface, glabrous below 16. *subsimilis*

# 1. *Ctenitis cirrhosa* (Schum.) Ching in Sunyatsenia 5 : 250 (1940).

Roux 2009: Accepted name

*Aspidium cirrhosum* Schum. in K. Danske Vidensk. Selsk. 4 : 231 (1829).

*Dryopteris cirrhosa* (Schum.) O. Kuntze Rev. Gen. 2 : 812 (1891).

*Nephrodium crinibulbon* Hook. Spec. Fil. 4 : 92, t. 244 (1862).

*Ctenitis crinibulbon* (Hook.) Ching in Sunyatsenia 5 : 250 (1940); Tard. in Notulae Syst. 14 : 342 (1962); op. cit. 15 : 81 (1954); in Mém. I.F.A.N 28 : 132(1953).

*Nephrodium welwitschii* Bak. Syn. Fil. 274 (1867).

*Aspidium pinnatifidoserratum* Mett. ex Kuhn Fil. Afr. 139 (1868).

*Dryopteris nimbaensis* Tard. in Notulae Syst. 13 : 370 (1948).

. *D. trachyrachis* Christ ex Bonap. Notes Ptérid. 15 : 17 (1924), name only.

On ground in forest; at low elevations.

**Fr.G.:** Caverne de Mamou Chev. 20360 (P); Dalaba to Diagulssa Chev. 12665 (P); Nimba Mts. Schnell 2877 bis (P). **Iv.C.:** Mt. Oroumba Boka, Dimbokro Abbayes 2201 (BM). **Ghana:** Bunso Scholes 326 (BM); Asuansi Box 2876 (BM); Kakum F.R., Krua Box 2917 (BM); Puso Puso Ravine Adams 494 (K). **Togo:** Mischlich (P). **Br.Cam.:** Cam. Mt. Mann 1390 (K).

Also south to Angola and in eastern Africa from the Sudan (Macleay 477) to Mozambique, also in Mascarene Islands.

2. *Ctenitis vogelii* (Hook.) Ching l.c. (1940).

Roux 2009: Synonym of *Triplophyllum vogelii* (Hook.) Holttum

*Aspidium vogelii* Hook. Ic. Pl. t. 921 (1854); Cent. Ferns t. 21 (1854).

*Lastrea vogelii* (Hook.) Moore Ind. 111. 108 (1858).

*Nephrodium vogelii* (Hook.) Hook. Spec. ML 4 : 130 (1862).

*Dryopteris vogelii* (Hook.) C.Ch. Ind. Fil. 300 (1905).

On wet banks and rocks, in rain forest.

**Br.Cam.:** near Cross River, Mamfe Savory 630 (BM). **F.Po:** T. Vogel 250 (K).

3. *Ctenitis lanigera* (Kuhn) Tard. in Notulae Syst. 14 : 343 (1952); in Mém. I.F.A.N. 28 : 41, t. 25, fig. 3, 4 (1953).

Roux 2009: Synonym of *Triplophyllum vogelii* (Hook.) Holttum

*Aspidium lanigerum* Kuhn Ml. Afr. 135 (1868).

*Dryopteris lanigera* (Kuhn) C.Ch. Ind. Fil. 273 (1905).

Terrestrial, in forests.

**Lib.:** Suacoco, Gbanga Daniel 401 (BM) 1 Bilimu Harley 2094 (BM). **Ghana:** Potroasi, Klbi Adams 154 (BM); Puso Puso Ravine Adams 3577 (BM), 81 (BM), Box 3267 (BM); Asuansi Box 2432 (BM). **Togo:** Buem Mischlich (BM). **S.Nig.:** Ehor & Ibekwe Fairbairn 5 (BM); Omo (formerly part of Shasha) F.R. Ross 195 (BM), Richards 3345 (BM), Jones & Onochie FHI 16652 (BM).

South to the Congo.

4. *Ctenitis pilosissima* (J. Sm.) Alston in Bol. Soc. Brot. sèr 2A, 80 : 11 (1956).

Roux 2009: Synonym of *Triplophyllum pilosissimum* (J.Sm. ex T.Moore) Holttum

*Lastrea pilosiuima* J. Sin. ex Moore in Gard. Chron. 1855 : 677 & Fig.

*Nephrodium variable* Hook. Spec. ML 4 : 140 (1862), partly excl. var.  $\beta$  and American plant.

**S.L.:** Don (BM). **Lib.:** Cape Palmas Ansell (K); Du K. Linder 220 (K). **Ghana:** Kakum F.R., Nfuom Box 2852 (BM), 2869 (BM); Nkwanta, Oda Box 2890 (BM). **Br.Cam.:** W. of Banga, S. Bakundu F.R., Kumba Brenan 4064 (BM); Barombi Preuss 266 (BM).

5. *Ctenitis protensa* (Afzel. ex Sw.) Ching l.c. (1940); Tard. in Mém. I.F.A.N. 28 : 134, t. 24, Fig. 5, 6 (1953).

Roux 2009: Synonym of *Triplophyllum protensum* (Afzel. ex Sw.) Holttum

*Aspidium protensum* Afzel. ex Sw. In Schrad. Journ. für Bot. 1800, 2 : 36 (1801).

*Dryopteris protensa* (Afzel. ex Sw.) C.Chr. Ind. Fil. 286 (1905).

*Aspidium subguinguefidum* P. Beauv. Fl. Oware 1 : 34, t. 19 (1805).

*Polypodium pubeseens* Schum. in K. Danske Vidensk. Selsk. 4 : 227 (1829), not of Linn. (1759).

Damp shady places on ground and rocks, in forest and plantations; at low elevations.

**Fr.G.:** Fouta Djallon Heudelot 703 (K, OXF); Los Isl. Mugnier–Serand (K). **S.L.:** Don (BM), Afzelius (BM); Njala Deighton 2095 (NJ); mouth of Kissy Stream Johnston (BM); Lumbaraya Sc. Elliot 4931 (BM, K); Mahnoo Mair (K). **Lib.:** Wanau–Gipu, Harley 1934 (BM), 1939 (BM). **Iv.C.:** Adio–podoumé Abbayes 64 (BM); region des Lagunes Cervoni (K). **Ghana:** Aburi Adams 178 (BM); Asuansi Box 2040 (BM); Foso–Juaso F.R. Scholes 256 (BM); Aburi Hills Darko (K). **S.Nig.:** Abeokuta Irving (K); Omo (formerly part of Shasha) F.R., Jones & Onochie FHI 17527 (BM), 14744 (BM), Richards 3169 (BM); Urhuehue, Usonigbe F.R., Keay & Onochie FHI 21586 (BM); Okomu F.R., Richards 3867 (BM, K); Old Calabar Robb (BM). **Br.Cam.:** Victoria Schlechter 12371 (BM, K); Njoke to Malende Schlechter 12867 (BM). **F.Po:** Mann (BM), Stoddart (K); Clarence T. Vogel 111 (K).

Also on Principe and south to Spanish Guinea (Guinea 136). (Fig. 14, C & D.)

#### 6. *Ctenitis speciosa* (Mett.) Alston l.c. (1956).

Roux 2009: Synonym of *Triplophyllum speciosum* (Mett. ex Ettingh.) Holttum

*Aspidium speciotum* Mett. ex Kuhn Fil. Afr. 142 (1868).

*Dryopteris protensa* var. *speciosa* (Mett.) C.Chr. in Perrier Cat. Pl. Madag. 29 (1932).

**Lib.:** Bilimu Harley F. 237 (BM), 1983 (BM); Wanau–Gipu Harley 1933 (BM), 1940 (BM), 1941 (BM).

**Ghana:** Potroasi, Kibi Adams 157 (BM); Puso Puso Ravine, Atewa range Adams 3581 (BM);

Also south to Belgian Congo and in Madagascar.

#### 7. *Ctenitis jenseniae* (C.Chr.) Tard. in Notulae Syst. 14 : 342 (1952); in Mém. I.F.A.N. 28 : 135, t. 25, Fig. 6 (1968).

Roux 2009: Synonym of *Triplophyllum jenseniae* (C.Chr.) Holttum

*Dryopteris jenseniae* C.Chr. in Dansk. Bot. Ark. 9, 3 : 63 (1937).

*Phegopteris sparsiflora* of Sadeb. in Ber. Deutsch. Bot. Ges. 13 : 21, t. 3 (1895).

Margin of streams.

**Fr.G.:** Bérzia Chev. 20778 (K). **S.L.:** near Timmi, Gbagbochujchen Deighton 1607 (BM, K, NJ).

**Lib.:** Bilimu Harley 2095 (BM); Bobei Harley F. 233 (BM, K); Gbeidin Harley V. 205 (BM); Wanau–Gipu Road Harley 1918 (BM); Bilipia Harley F. 171 (BM, K); Gola Forest Bunting (BM). région des Lagunes Cervoni (K). **Ghana:** Foso–Juaso F.R. Box 2069 (BM), 2485 (BM); Kakum F.R., Nfuom Box 2868 (BM); Asuansi Box 2097 (BM); Ampeson F.R., Prestea Cudjoe 29 (K); Bompata Vigne FH 2707 (K).

Also south to Belgian Congo.

#### 8. *Ctenitis securidiformis* (Hook.) Copel. var. *securidiformis* — Gen. Fil. 125 (1947); Tard. in Mém. I.F.A.N. 28: 132, t. 24, Fig. 3 (1953).

Roux 2009: Synonym of *Triplophyllum securidiforme* (Hook.) Holttum var. *securidiforme*

*Nephrodium subquinquefidum* var. *securidiforme* Hook. Spec. Fil. 4: 130 (1862)

*Aspidium securidiforme* Mett. ex Kuhn Fil. Afr. 141 (1868).

*Nephrodium securidiforme* (Mett.) Diels in E. & P. Pflanzenfam. 1, 4: 175 (1899).

*Dryopteris securidiformis* (Hook.) C.Ch. Ind. Fil. 291 (1905).

On ground, In forest.

**Fr.G.:** Gouée to Nzo Abbayes 613 (BM). **S.L.:** Morson (K). **Lib.:** Billmu Harley F. 102 (K) F 75 (K), F. 179 (BM, K), 178 (BM, K). **Ghana:** Begoro Hills Johnson 922 (K); Puso Puso Ravine Adams 3852 (K), Scholes 442 (BM); Kakum F.R., Box 2860(BM); Atewa Range, Kibi Box 3505 (BM); Bosuso Box 2941 (BM). **S.Nig.:** Kwa Falls, Calabar Richards 3990 (BM, K); Oban Talbot (BM). **Br.Cam.:** Mamfe Rosevear (BM); Bopo, S. Bakundu F.R., Richards 4040 (K); Victoria Kalbreyer 22 (BM) **F.Po.:** Mann (BM), 130 (K), Barter (K); Ureka Thorold 27 (BM); San Carlos Guinea 698 (BM).

Also in French Cameroons.

8a. *Ctenitis securidiformis* var. *nana* (Bonap.) Tard. in Mém. I.F.A.N. 28: 134 (1953).

Roux 2009: Synonym of *Triplophyllum securidiforme* (Hook.) Holttum var. *nanum* (Bonap.) Holttum

*Dryopteris securidiformis* var. *nana* Bonap. Notes Ptérid. 14: 211 (1923).

Pinnules less than 2 cm. long (3 1/2 cm. long in typical form). On rocks by streams in forest; at 1,000 ft. alt.

**S.Nig.:** Cross R. Holland 193 (K); Mfum ferry, Cross R. Keay FHI 28313 (BM); Bendiya Ayuk, Ikom Jones & Onochie FHI 14128 (BM). **Br.Cam.:** Kumba Richards 4069 (BM, K); Mamfe Rosevear (BM); Munanya R., Mamfe Adams 1334 (BM); Johann-Albrechtshöhe Staudt 881 (BM).

Also in S. Tomé and Belgian Congo.

9. *Ctenitis buchholzii* (Kuhn) Alston l.c. (1956).

Roux 2009: Synonym of *Triplophyllum buchholzii* (Kuhn) Holttum

*Aspidium buchholzii* Kuhn in Deck. Reisen Ost-Afr. 3: 47(1879).

*Dryopteris buchholzii* (Kuhn) C.Ch. Ind. Fil. 256 (1905).

*Tectaria buchholzii* (Kuhn) Copel. in Phil. Journ. Sci. 38: 138 (1929); Tard. in Mém. I.F.A.N. 28: 143, t. 26, Fig. 4, 5 (1953).

**Iv.C.:** Grabo Chev. 19734 (P).

Also in French Cameroons (Mildbr. 5669), Gabon, French Congo and Belgian Congo (Wellens 334).

10. *Ctenitis lanuginosa* (Willd. ex Kaulf.) Copel. Gen. Fil. 124 (1947); Tard. in l.c. 139, t. 26, Fig. 3 (1953).

Roux 2009: Synonym of *Megalastrum lanuginosum* (Willd. ex Kaulf.) Holttum

*Aspidium lanuginosum* Willd. ex Kaulf. Enum. Fil. 244 (1824).

*Dryopteris lanuginosa* (Willd. ex Kaulf) C.Chr. Ind. Fil. 273 (1905).

Terrestrial; 4,000 to 7,000 ft. alt.

**F.Po:** St. Isabel Peak Adams 1145 (BM), Mann 349 (K),

Also in S. Tomé, S. Africa and the Mascarene Islands. (Fig. 14, A & B.)

11. *Ctenitis barteriana* (Hook.) Alston l.c. 12 (1956).

Roux 2009: Synonym of *Lastreopsis barteriana* (Hook.) Tardieu

*Polypodium barterianum* Hook. Spec. Fil. 4: 253 (1862).

*Lastreopsis barteriana* (Hook) Tard. in Notulae Syst. 14: 343 (1952); in Mèm. I.F.A.N. 28: 129, t. 23, Fig. 1 (1953).

*Dryopteris barteriana* (Hook.) C.Chr. Ind. Fil. 254 (1905).

*Polypodium rufescens* of Hook. & Bak. Syn. Fil. 309 (1867), partly, as to syn, P. barterianum.

? *Nephrodium hendersoni* Bak. in Ann. Bot. 5: 323 (1891).

? *Dryopteris hirsutifrons* C.Chr. Ind. Fil. 270 (1905).

On ground in forest at about 1,000 ft. alt.

**Br.Cam.:** near Cross River, Mamfe Savory 630a (BM). **F.Po:** Henderson (K), Mann (BM), Barter (K).

Also in French Cameroons.

12. *Ctenitis pubigera* Alston l.c. (1956).

Roux 2009: Synonym of *Lastreopsis nigritiona* (Baker) Tindale

*Polypodium vogelii* Hook. Spec. Fil. 4: 271(1862), partly, as to Barter 158.

*Polypodium nigritionum* Bak. Syn. Fil. 313 (1867).

*Dryopteris nigritiona* (Bak.) C.Chr. Ind. Fil. 279 (1905), not of O. Kuntze (1891).

*Ctenis currori* of Tard. in l.c. 137 (1953), partly.

Terrestrial in forested ravines; 2,000 to 3,000 ft. alt.

**S.Nig.:** Aboh Barter 158 (K). **Br.Cam.:** Victoria Kalbreyer 20 (BM); Mile 60 on Mamfe–Bamenda Road Adams 1593 (BM). **F.Po:** Mann 352 (K).

13. *Ctenitis subcoriacea* (C.Chr.) Alston l.c. (1956).

Roux 2009: Synonym of *Lastreopsis vogelii* (Hook.) Tindale

*Polypodium vogelii* Hook. Spec. Fil. 4: 271 (1862), partly excl. spec. Barter 158 &



Forbes; not *Ctenitis vogelii* (Hook.) Ching (1940)

*Dryopteris subcoriacea* C. Chr. Ind. Fil. 295 (1905).

*Ctenitis efulensis* of Tard. l.c. 138 (1953), partly.

**S.Nig.:** Okomu F.R., Brenan & Keay 3696 (K). **F.Po:** T. Vogel 229 (K).

14. *Ctenitis efulensis* (Bak.) Tard. in Notulae Syst. 14: 342 (1952); in Mèm. I.F.A.N. 28: 138, t. 23, Fig. 5 (1953), exol. syn. *Dryopteris subcoriacea*.

Roux 2009: Synonym of *Lastreopsis currorii* (Mett. ex Kuhn) Tindale subsp. *currorii*

*Polypodium efulense* Bak. in Kew Bull. 1897: 299.

*Dryopteris efulensis* (Bak.) C. Chr. Ind. Fil. 263 (1905).

**Lib.:** Bilimu Harley F. 59 (BM). **Ghana:** Puso Puso Adams 335 (BM), 80 (BM), Box 3264 (BM) Potroasl, Kibi Adams 166 (BM); Bunso F.R., Scholes 327 (BM). **S.Nig.:** Obam Itiat to Ekpene Itu Calabar Jones FHI 4806 (BM). **Br.Cam.:** Mamfe Savory TJCI 491 (BM).

Also south to Belgian Congo (Howard de Walden 33).

15. *Ctenitis nigritiona* (Mett.) Alston l.c. (1956).

Roux 2009: Synonym of *Lastreopsis nigritiona* (Baker) Tindale

*Aspidium nigritionum* Mett. ex Kuhn Fil. Afr. 138 (1868)

*Dryopteris nigritiona* (Mett.) O. Kuntze Rev. Gen. FL. 2: 813 (1891).

*D. tomentella* C. Chr. Ind. Fil. 298 (1905)

**Lib.:** Bilimu Harley F. 175 (BM). **Ghana:** 5 miles N. of Bosuso Box 2945 (BM); Atewa Range Kibi Mts. Box 3505a (BM).

Also in Principe (*Barter* 1906).

16. *Ctenitis subsimilis* (Hook.) Tard. in Notulae Syst. 14: 342 (1952); in Mém. I.F.A.N. 28: 137, t. 24, Fig. 1, 2 (1953).

Roux 2009: Synonym of *Lastreopsis subsimilis* (Hook.) Tindale

*Oymnogramme subsimilis* Hook. Spec. Fil. 6; 142 (1864).

*Dryopteris subsimilis* (Hook.) C. Chr. Ind. Fil. 296 (1905).

**iv.C.:** 5 km. M. of Adiopodoumé Roberty 12015 (K). **Dah.:** Allada Region Chev. 23411, 23412 (ex Tard.) **S.Nig.:** Usonigbe F.R., Benin Keay FHI 25587 (BM). **Br.Cam.:** Victoria Kalbreyer 14 (BM). **F Po:** Mann (BM), 125 (ex Hook.).

Also in Gabon.

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5. *TECTARIA* Cav. — Copel. Gen. 128 (1947).

*Aspidium* Sw. — Sim F.S.A. 113 (1915).



- 1      Terminal pinna not lobed, similar to lateral pinnae: **2**  
       Terminal pinna lobed: ----- **3**
- 2      Rhizome creeping; sori elongate, irregularly distributed; margin sinuate; gemmae sometimes present in axils of lateral pinnae *1. varians*  
       Rhizome erect; sori round, in two rows between the main veins; gemmae wanting ----- *2. barteri*
- 3      Rhizome horizontal, usually wide-creeping up to 5 mm. diam.; fronds not caespitose, not gemmiferous, triangular; sori exindusiate; veins often blackish. **3.**  
*angelicifolia*  
       Rhizome ascending, stout; fronds caespitose, elongate and deltoid; indusia present, often deciduous; veins not blackish: ----- **4**
- 4      Fronds not gemmiferous; stipe purplish or black; rhizome forming short erect trunk up to 60 cm. high *4. camerooniana*  
       Fronds usually gemmiferous with gemmae on both surfaces; stipe grey or castaneous; rhizome suberect, short **5.**  
*fernandensia*

1. *Tectaria varians* (Moore) C.Ch. Ind. Fil. Suppl. 3: 186 (1934), emend. Tard. in Mém. I.F.A.N. 28: 142 t 27 Fig. 5 (1953).

Roux 2009: Synonym of *Triplophyllum varians* (T.Moore) Holttum

*Dictyopteris varians* Moore in Gard. Chron. 1863: 1108.

*Polypodium sparsiflorum* Hook Spec. Fil. 5: 92 (1863); Syn. Fil. 319 (1867).

*Aspidium sparsiflorum* (Hook.) Diels in E & P. Pflansenfam. 1, 4: 185 (1899).

*Tectaria sparsiflora* (Hook.) Alston in J. Bot. 72, Suppl. 3 (1934).

Rocky ground in rain forest; up to 1,000 ft, alt.

**Fr.G.:** near N'zo Schnell 81 (P). **Iv.C.:** Jolly (P). **Ghana:** Burton & Cameron (K). **S.Nig.:** Oban Talbot (BM), Mann 213 (BM); Kwa Falls, N.E. of Calabar Henderson (K), Richards 3992 (BM, K); Calabar Kalbreyer 213 (BM, K), Mann 2335 (K), Moore (K). **Br.Cam.:** Mamfe Rosevear (BM), Rudatis 87 (BM).

Also in French Cameroons (Zenker 257), Spanish Guinea (Mann 1634) and Cabinda (Gassweilr 7724).

2. *Tectaria barteri* (J. Sm.) C.Ch. Ind. Fil. Suppl. 3: 177 (1934); Tard. in Mém. I.F.A.N. 28: 143, t. 27, Fig. 6 (1953).

Roux 2009: Accepted name

*Aspidium Barteri* J. Sm. Ferns Brit. & For. 286 (1866).

*Nephrodium barteri* (J. Sm.) Bak. in Hook. Syn. Fil. 299 (1867).

Rocky forest; up to 800 ft. alt.

**S.Nig.:** British Obokum James & Onochie FHI 18884 (BM), 18879 (BM); Afi River F.E., Ikom Keay. FHI 5435 (BM). **Br.Cam.:** L. Barombi, Kumba Box 3600 (BM), 3599 (BM); Barombi Station Preuts

358 (BM); Johann–Albrechtshöhe Staudt 447 (BM, K); Mamfe Rosevear (BM); Victoria Kalbreyer 23 (BM). **F.Po:** Mann (BM), Barter (BM), 143 (K), Henderson (K); near Bassepool Barter (K).

3. *Tectaria angelicifolia* (Schum.) Copel. in Phil. Journ. Sci. Bot. 2: 410 (1907); Tard. l.c. 143, t. 27, fig. 1, 2 (1953).

Roux 2009: Accepted name

*Polypodium angelicaefolium* Schum. in. K. Danske Vidensk. Selsk. 4: 228 (1829).

*Aspidium angelicifolium* (Schum.) C.Ch. Ind. Fil. p. 64 (1905).

*Polypodium tenerifrom* Hook. Sp. Fil. 5: 104 (1864), partly, excl. Burmese plant.

*Aspidium gaboonense* Kuhn Fil. Afr. 133 (1868), name only.

*A. nigrescens* Mett. ex Kuhn Fil. Afr. 137 (1868).

*Nephrodium nigrescens* (Mett. ex Kuhn) Bak. Syn. Fil. 504 (1874).

*Tectaria nigrescens* (Mett.) C.Ch. Ind. Fil. Suppl. 3: 182 (1934); Tard. l.c. 145, t. 28, Fig. 3, 4 (1953).

*Tectaria nicklesii* Tard. in Notulae Syst. 13: 167 (1948).

In forest and plantations on ground; up to 700 ft. alt.

**Fr.G.:** Kouria Caille 15051 (K). **S.L.:** Don (BM); Wailia Sc. Elliot 4570 (BM, K); Yelambe to Banda T. S. Jones 18 (BM). **Lib.:** Yosono Harley 199 (BM, K); Wanau–Gipu Road Harley 1917 (BM); Wanau Harley 1920 (BM). **Iv.C.:** Adlopodoumé Abbayes 167 (BM); Akabilekrou Chev. 22514 (P); Bangonanai & Ende Chev. 22467 (BM). **Ghana:** near Akwapim Thonning (photo BM); Asuansi Box 2048 (BM), 2039 (BM), 2436 (BM), 2435 (BM); Agogo Foote 106 (BM); Kew Tafo Lovi 12 (BM); Bompata Vigne FH 2706 (K); Mampong Vigne FH 4103 (K); Kumasi Cummins 94 (K). **N.Nig.:** Awton & Gogo Elliott 76 (K). **S.Nig.:** Okomu F.R. Richards 3683 (BM, K), Ross 145 (BM); Sapoba Ross 170 (BM); Afi River F.R., Ikom Jones & Onochie FHI 18773 (BM); Calabar Clark (K). **Br.Cam.:** Kumba Ejiofor FHI 14029 (BM); Johann–Albrechtshöhe De Gironcourt 407 (K). **F.Po:** Mann 142 (BM, K), Henderson (K), Barter (K).

Extends to the Sudan (Williams 484) and Uganda (Longfield 121).

4. *Tectaria camerooniana* (Hook.) Alston in J. Bot. 77: 288 (1939); Tard. in Mém. I.F.A.N. 28: 142, t. 28, Fig. 4 (1953).

Roux 2009: Accepted name

*Polypodium cameroonianum* Hook. Spec. Fil. 5: 104 (1864); Syn. Fil. 318 (1867).

On ground in forest, 3,000–4,000 ft. alt.

**Br.Cam.:** Cam. Mt. Mann 1362 (K); path to Mann's Spring Adams 1645 (BM); Buea Migeod 14 (BM, K). **F.Po:** Baladru Guinea 1477 (BM); St. Isabel Peak Adams 1153 (BM).

Also in S. Tomé.

5. *Tectaria fernandensis* (Bak.) C.Ch. Ind. Fil. Suppl. 3: 179 (1934); Tard. l.c. 148, t. 28, Fig. 1 (1953).

Roux 2009: Accepted name

*Polypodium fernandense* Bak. in Ann. Bot. 5: 462 (1891).

*Tectaria puberula* of Tard. l.c. 146 (1953), not of C.Chr.

Terrestrial, on rocky ground, in forest.

**Fr.G.:** Dalaba Schnell 94 (P); Macenta Jac.–Fél. 1009 (P); Mt. Nimba Portères (P), Schnell 260 (P), 265 (P), 682 (P), 1006 (P), 1011 (P), 1211 (P), 2861 (P), Adam 3226 (P); Kouria Caille 15051 (P). **S.L.:** Don (BM); Bintumane Mt. T. S. Jones 26 (BM), 25 (BM). **Lib.:** Bilimu Harley F. 200 (BM, K), F. 61 (BM).

**Iv.C.:** Dans Massif Schnell 1233 (P); Beirodido Scaëtta 3242 (P). **Ghana:** Asiakwa Adams 188 (BM); Begoro Adams 244 (BM); Puso Puso Adams 338 (BM), 336 (BM), 318 (BM), Box 3259 (BM); Bekwai–Manso Nkwanta Road Box 2911 (BM); Merishe, Adiembra Kitson 1220 (K). **Togo:** Kling Fall Kertsting A. 64 (BM). **S.Nig.:** Idanre Hills Brenan 3848 (BM, K), Keay FHI 22685 (BM), Richards 8774 (K); Ijua, Obudu Savory & Keay FHI 25026 (BM). **Br.Cam.:** Cam. Mt. Adams 1228 (BM), Johnston 141 (BM), Dunlap 69 (K), 131 (K); Buea Migeod 246 (BM, K), 123 (BM, K), Annet 71 (P); above Bamenda Migeod 467 (BM, K). **F.Po:** Henderson 461 (K).

Also south to Angola.

## 27. BLECHNACEAE

Rhizome forming an erect trunk or wide-climbing, scaly at apex. Stipes not jointed at base, with several vascular strands; fronds pinnate, simple in the juvenile state, never gemmiferous; pinna supply extra-marginal; veins free, parallel, once or twice forked; sori linear close to the costa or nearly covering the whole undersurface; indusia linear, opening inwards. This indusium is really a false indusium or modified leaf margin and the photosynthetic lamina of the fertile frond of *Eu-Blechnum*, which forms a flange extending beyond the indusium is a new structure (see Bower Ferns 3: 165 (1928)). Sporangia rather long-stalked with 4–5 cells. Annulus with 13–28 cells. Spores monolete, with perispore (at least in W. African species). Gametophyte broadly cordate at maturity, monoecious, with papillate hairs on both surfaces, midrib sometimes becoming thick with a dense growth of reddish-brown rhizoids; antheridia with columnar basal cell and undivided cap-cell.

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*BLECHNUM* Linn. — Sim F.S.A. 177 (1915); Copel. Gen. 155 (1947).

**1** Frond not markedly decrescent; sterile pinnae with cuneate bases; rhizome erect often with a short trunk *1. tabulare*

Frond markedly decrescent with pinnae dwindling to small auricles; sterile pinnae broadly adnate at base; rhizome scandent -----*2. attenuatum*

**1.** *Blechnum tabulare* (Thunb.) Kuhn Fil. Afr. 94 (1868); Sim F.S.A. 187, t. 83 (1915); Schelpe in J. Linn. Soc. 53: 494 (1952).

Roux 2009: Accepted name

*Pteris tabularis* Thunb. Prod. Fl. Cap. 171 (1800).

*Onoclea boryana* Sw. Syn. Fil. 11l: 306 (1806).

*Lomaria boryana* (Sw.) Willd. Sp. FL. 5: 292 (1810); Hook. Syn. Fil. 180 (1867), partly.

Terrestrial, on moist rocky slope in savannah grassland; 5,000 to 5,400 ft. alt.

**S.Nig.:** north side of Mt. Koloishe, Obudu Savory & Keay FHI 25089 (BM). **Br.Cam.:** Bambulue Savory UCI 478 (BM).

Also east to Uganda and south to Cape Province.

**2.** *Blechnum attenuatum* (Sw.) Mett. Fil. Hort. Bot. Lips. 64, t. 3, fig. 1–6 (1856); Sim F.S.A., 179, t. 25 (1916); Schelpe l.c. (1952); Tard. in Mém. I.F.A.N. 28: 201, t. 39, fig. 7 (1953).

Roux 2009: Accepted name

*Onoclea attenuata* Sw. in Schrad Journ. für Bot. 1800, 2: 73 (1801).

*Lomaria attenuata* (Sw.) Willd. Sp. PL. 5: 290 (1810); Hook. Syn. Fil. 176 (1867), partly.

On tree trunks in mossy forest; 3,000 to 6,000 ft. alt.

**Br.Cam.:** above Buea Box 3607 (BM), Brenan 4383 (BM, K), Migeod: 102 (K.); Esele, Cam. Mt. Maitland 1045 (K). **F.Po:** Mann (K.); Loretto L., near Moka Adams 1010 (BM); way to Las Cascavas, Moka Guinea 2152 (BM).

Also east to Uganda and south to Cape Province

# CYTOLOGICAL INFORMATION ON THE FERNS OF WEST TROPICAL AFRICA

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## INTRODUCTION

THIS is the third cytological sample of a tropical fern Flora to have been compiled, the other two being those of Ceylon (Manton & Sledge, 1954) and Malaya (Manton in Holttum, 1954). The request to me to undertake it was made by the late A. H. G. Alston in 1955, and up till the time of his death in 1958 all species received at Kew for this purpose were named by him, according to the terminology of the text of this Flora. Since very little has been added later than that date the list of species is substantially as Alston left it.

All the species listed have been gathered recently from their wild localities. By far the largest share in this collecting has been done in West Africa by Dr. C. D. Adams and colleagues at the University College of Ghana. A few other collections from Nigeria, Sierra Leone, Belgian Congo and elsewhere in tropical Africa have been made by other travellers contributing single species.

Most species were sent as adult plants conveyed to Kew by air and there established in temporary or permanent culture. A few have been raised at Kew from spores and a few others have been worked cytologically from fixed sporangia sent from Ghana by Dr. Adams for special cases where insuperable difficulties of culture or transplanting were known to exist.

The cytological work has all been done in Leeds on fixations taken at Kew or received by post. For a few species I have been able to quote observations by my colleague Dr. T. Walker, which are here gratefully acknowledged. I am personally responsible for the remainder and since all have had to be handled incidentally to much other work, and at a long distance from the living material in London, final accuracy is only claimed for a proportion of species leaving others with an approximation mark (c. from the Latin *circa*) to indicate that further work is needed.

The objects which can be attained by an enquiry such as this are many. For the better known temperate Floras it is now generally agreed that cytological criteria are in many cases necessary for the critical appraisal of species, and this is at least as true for tropical Floras. A bad taxon based on a hybrid may escape detection as such by ordinary herbarium methods but be at once revealed by chromosome behaviour. *Asplenium akimense* in the present Flora is a case in point. Confusions due to too wide or too vague a concept of species can be detected by finding different chromosome numbers among representatives of a supposedly single species in different localities. The findings for *Aleuritopteris farinosa sens. lat.* and *Asplenium aethiopicum sens. lat.* exemplify this within the Flora, and the discrepancy between the results for *Microlepia speluncae* in Africa compared with those from Malaya and Ceylon raise the same type of problem over a wider area. The problems so raised are not solved by the preliminary cytological facts, but without this knowledge the herbarium botanist's task of description and naming may be so difficult as to be impossible; hence perhaps the persistence with which such complexes remain unsolved or even forgotten in spite of much skilled taxonomic attention devoted to the Flora as a whole.

In certain cases the species themselves may be of importance for an understanding of evolutionary sequences in ferns as a whole. The detection of ancestral types for well-known species, e.g. *Pteris tripartita* or *Asplenium unilaterale* contributes valuable information towards an understanding of the history and migration of Floras. Finally, the opportunity for examining samples of critical genera such as *Lonchitis*, *Anisosorus*, or *Loxoscapha*, have greatly clarified phyletic concepts in the groups to which they are assigned.

Further understanding of all these topics nevertheless requires more thorough study of individual species and local populations than can be dealt with effectively by anyone not living in Africa, and the hope of interesting local African botanists in work of this kind was almost certainly in Alston's mind when he asked for this sample to be compiled. It is not an unreasonable hope since the methods now available are not difficult and are effective under tropical conditions. Further information on methods will be found in the papers listed below and especially in Manton, 1950 and 1958

## DETAILS OF LITERATURE CITED

- Manton, I. (1950). *Problems of Cytology and Evolution in the Pteridophyta*, Cambridge University Press.  
Manton, I. and Sledge, W. A. (1954). *Observations on the Cytology and Taxonomy of the Pteridophyte Flora of Ceylon*, Philosophical Transactions of the Royal Society of London, Series B. Biol. Sciences, No. 654, Vol. 238, pp. 127-185.  
Manton in Holttum (1954). *Appendix: Cytological Notes on One Hundred Species of Malayan Ferns. Flora of*

*Malaya*, Vol. II Ferns, R. E. Holttum, Government Printing Office, Singapore.

Manton, I. (1958). *Chromosomes and Fern Phylogeny with special reference to "Pteridaceae,"* J. Linn. Soc. Lond., Zoo. Vol. XLIV, 295, and Bot. Vol. LVI, 365.

## LIST OF SPECIES

The species are arranged in the same order as in the Flora. Localities placed in brackets indicate places from where material was obtained outside the area covered by this Flora.

Name	Locality	Cytology	Comments
OPHIOGLOSSACEAE			
<i>Ophioglossum costatum</i>	Sierra Leone	n = c. 116	Very high numbers probably on more than one base are characteristics of this genus. <i>O. costatum</i> is so far the lowest known.
MARATTIACEAE			
<i>Marattia fraxinea</i>	Ghana	n = 40	T. Walker, unpub.
OSMUNDACEAE			
<i>Osmunda regalis</i>	Br. Cameroons	n = 22	This number is very uniformly present in all genera and species of Osmundaceae (see M., 1950).
CYATHEACEAE			
<i>Cyathea camerooniana</i>	Ghana	n = c. 70	Most known Cyatheas have exactly n = 69 (M. & S., 1954, M. in H. 1954). This species should be carefully re-examined.
HYMENOPHYLLACEAE			
<i>Trichomanes cupressoides</i>	Ghana	n = 33	T. Walker, unpub.
DENNSTAEDTIACEAE			
<i>Microlepia speluncae</i>	Ghana, Br. Cameroons	n = 129	This is a hexaploid on 43. In Malaya and Ceylon this species is tetraploid (n = 86) (see M. & S., 1954).
<i>Pteridium aquilinum</i>	(Madeira)	n = 52	This number also recorded in Europe, Malaya, Ceylon and N. America.
<i>Anisosorus occidentalis</i>	Ghana	n = c. 50	(See M., 1958).
<i>Lonchitis currori</i>	Ghana	n = 76	
<i>mannii</i>	Br. Cameroons	n = 38	(Illustrated M., 1958).
VITTARIACEAE			
<i>Vittaria guineensis</i>	Ghana	n = c. 120	The genus is based on n = 30 (see M. & S., 1954).
ADIANTACEAE			
<i>Acrostichum aureum</i>	Ghana	n = 30	As in Ceylon (M. & S., 1954).
<i>Coniogramme africana</i>	Br. Cameroons	n = c. 60	
<i>Adiantum soboliferum</i>	Ghana	n = 60	
<i>Adiantum philippense</i>	(S. Africa)	n = 90 (apogamous)	As in Ceylon (M. & S., 1954).
<i>confine</i>	Ghana	n = 60	Closely related to <i>C. rhizophyllum</i> , a diploid, in Mauritius (Ghartak thesis).



incisum	Ghana, (Sudan, Tanganyika)	n = 60	Related to and fertile with <i>A. caudatum</i> sens. strict., an apogamous triploid (Gha- tak thesis).
oatesii	Ghana	2n = c. 120	
vogelii	Ghana	n = 60	
poiretii	Br. Cameroons	2n = 114	The only specimen available showed complete failure of chromosome pairing. Hybridity unlikely in view of the unusual chromosome number but might be apogamous. Should be re-investigated.
ADIANTACEAE			
<i>Adiantum capillus-veneris</i>	(Tanganyika)	n = 60	This species is usually diploid with n = 30 (Europe and Ceylon M. & S., 1954). Should be re-examined taxonomically.
<i>Pteris vittata</i>	Ghana, Br. Cameroons	n = 58	Similar in Ceylon (M. & S., 1954).
<i>camerooniana</i>	Br. Cameroons	n = 29	
<i>togoensis</i>	Nigeria	n = 29	T. Walker, unpub.
<i>biaurita</i>	Ghana	"n" = 58 (apogamous)	T. Walker, unpub. Not the same as <i>P. togoensis</i> in the Flora, p. 40.
<i>dentata</i>	(Uganda, St. Helen a)	n = 29	T. Walker, unpub.
<i>acanthoneura</i>	(Uganda)	n = 29	T. Walker, unpub.
<i>atrovirens</i>	Ghana, (Belgian Congo)	n = 58	T. Walker, unpub.
<i>burtoni</i>	Ghana	n = 29	T. Walker, unpub.
<i>marginata</i>	Ghana	n = 29	Close to <i>P. tripartita</i> and formerly attributed to it. Perhaps an ancestor of it. ( <i>P. tripartita</i> has n = 58.)
<i>intricata</i>	Br. Cameroons	n = 58	T. Walker, unpub.
<i>Cheilanthes farinosa</i>	(Kenya, Eritrea)	"n" = 90 (sexual)	Apogamous (M. & S., 1954).
	(Victoria Falls)	n = 60 (sexual)	Clearly a complex in need of revision.
	(Tanganyika)	n = 30	
<i>Doryopteris kirkii</i>	Ghana, (Kenya)	n = 30	(M. & S., 1954, as D.
<i>Pellaea doniana</i>	Ghana	n = 29	concolor.)
<i>Actiniopteris radiata</i>	(Kenya, Abyssinia)	"n" = 87 (Apogamous)	(M. & S., 1954.)
POLYPODIACEAE			
<i>Platyterium angolense</i>	(Kew)	n = 37	

<i>Drynaria laurentii</i>	Ghana	n = 37	As other species in Ceylon and Malaya (M. & S., 1954).
<i>Phymatodes scolopendria</i>	Ghana	n = 36	As in Ceylon (M. & S., 1954.)
<i>Pleopeltis preussii</i>	Br. Cameroons	n = 35	
<i>lanceolata</i>	Br. Cameroons	n = c. 70	
<i>Microgramma owariensis</i> ( <i>lycopodioides</i> )	Ghana	n = c. 37	
<i>Microsorium punctatum</i>	Ghana	n = 36	As in Ceylon and Malaya (M. in H. 1954).
DAVALLIACEAE			
<i>Nephrolepis undulata</i>	Ghana	n = 41	
<i>pumicocola</i>	Nigeria	n = 41	
<i>biserrata</i>	Ghana	n = 41	
<i>Arthropteris palisoti</i>	Ghana	n = 41	
<i>orientalis</i>	Br. Cameroons, (Kenya)	n = 41	
<i>monocarpa</i>	Ghana	n = 41	
<i>Oleandra distenta</i>	Ghana	n = 41	
<i>Davallia</i>	Ghana	n = 120	Other species in Ceylon and Malaya have n = 40 (M. & S. 1954).
<i>chaerophylloides</i>			
ASPLENIACEAE			
<i>Asplenium africanum</i>	Ghana	n = 72	
<i>currori</i>	Ghana	n = c. 72	
<i>variabile</i>	Ghana	n = 72	
<i>var. variabile</i>			
<i>variabile</i>			
<i>var. paucijugum</i>	Ghana	n = 144	
<i>akimense</i>	Ghana	2n = 144 (unpaired)	A sterile hybrid probably involving <i>A. variabile</i> var. <i>variabile</i> with some other species.
<i>emarginatum</i>	Ghana	n = c. 72	
<i>barteri</i>	Ghana	n = c. 72	
Name	Locality	Cytology	Comments

## ASPLENIACEAE

<i>Asplenium unilaterale</i>	Ghana	n = 36-40	This is a diploid compared with specimens from Ceylon which are tetraploid (M. & S. 1954).
<i>diplazisorum</i>	Ghana	n = 70	Unusually large chromo
<i>suppositum</i>	(Mozambique)	n = c. 72	somes.
<i>monanthes</i>	(Madeira) "n" = 108		Apogamoua triploid.
<i>cuneatum</i>	Ghana	n = c. 72	
<i>formosum</i>	Nigeria	n = c. 36	
<i>protensum</i>	Br. Cameroons	n = c. 144	
<i>friesiorum</i>	Br. Cameroons	n = c. 70	
<i>hemitomum</i>	Ghana	n = 144	
<i>aethiopicum</i>	(Madeira)	n = c. 216	12-ploid. Obviously a
	Br. Cameroons (Kenya, etc.)	n = 144 n = 72	complex in great need of critical revision.
<i>stuhlmannii</i>	Ghana	n = 144	
<i>buettneri</i>	Ghana	n = c. 144	
<i>adiantum-nigrum</i>	(Kenya, Tanganyika)	n = 72	T. Walker, unpub.
<i>vagans</i>	(Kenya)	n = 72	
<i>(sandersonii)</i>			
<i>dregeanum</i>	Nigeria, (Madagascar)	n = 72	
<i>comutum</i>	(Kenya)	n = c. 70	In M. & S., 1954.
<i>(Loxoscaphe thecifera)</i>			

## THELYPTERIDACEAE

<i>Thelypteris microbasis</i>	Br. Cameroons	n = 72	
<i>cruciata</i>	Ghana	n = 62	
<i>Cyclosorus gongylodes</i>	(Tanganyika)	2n = c. 72	As in Ceylon (M. & S.,
<i>striatus</i>	Ghana	n = 36	1954).
<i>quadrangularis</i>	Nigeria, Ghana	n = 36	This is genetically con- specific with <i>C. conti- guus</i> of Malaya (Gha- tak thesis).
<i>dentatus</i>	Ghana, (Madeira)	n = 72	
<i>patens</i>	Ghana	n = c. 36	
<i>afer</i>	Ghana	n = 72	
<i>(dewevrei)</i>			

Leptogramma pilosiuscula ( <i>africana</i> )	(Madeira)	n = 72	(M. & S., 1954.)
ATHYRIACEAE			
Athyrium schimperi	Br. Cameroons	n = 40	
ammifolium	Br. Cameroons	n = c. 160	
Diplazium welwitschii	Ghana	n = 123	
proliferum	Ghana	n = c. 80 (prob. 82)	
LOMARIOPSIDACEAE			
Lomariopsis guineensis	Ghana	n = c. 39	This is the only species of Lomariopsis yet examined and others should be worked before this number is accepted as truly representative.
Bolbitis auriculata	Ghana	n = c. 82	This genus is known to be based on n = 41 M. in H., 1954).
acrostichoides	Ghana	n = 41	T. Walker, unpub.
ASPIDIACEAE			
Dryopteris athamantica	Br. Cameroons	n = 41	
pentheri	Br. Cameroons	n = 41	
Polystichum fuscopaleaceum	Br. Cameroons	n = 82	Probably related to European P. <b>setiferum</b> which is, however, diploid.
Ctenitis cirrhosa	Ghana	n = c. 40	
lanigera	Ghana	n = c. 82	
pilosissima ( <i>variabile</i> )	Ghana	n = 82	
protensa	Ghana	n = 82	
jenseniae	Ghana	n = 82	
ASPIDIACEAE			
Ctenitis securidiformis	Ghana	2n = 123	T. Walker, unpub. Tri- ploid chr. number in a root sent by post, not known whether plant a hybrid or apo- gamous ; should be re-investigated.
fulgens	Ghana	n = 41	
Tectaria harteri	Br. Cameroons	n = c. 80	
angelicifolia	Ghana	n = c. 160	
fernandensis	Ghana	n = c. 40	
BLECHNACEAE			
Blechnum attenuatum	(Table Mountain)	n = 64	Other numbers in this genus are 26, 28, 33, 34 and multiples.